A PRACTICAL TREATISE

ON THE

DISEASES OF INFANCY AND CHILDHOOD.

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OF

INFANCY AND CHILDHOOD.

BY THE LATE

THOMAS HAWKES TANNER, M.D., F.L.S, &c.,

AND

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TO

SIR WILLIAM FERGUSSON, BART., F.R.S.,

PROFESSOR OF SURGERY IN KING'S COLLEGE, LONDON;
SERGEANT-SURGEON TO H.M. THE QUEEN;
SURGEON IN ORDINARY TO HIS LATE R.H. THE PRINCE CONSORT;
&c. &c. &c.

THIS VOLUME

IS MOST GRATEFULLY AND AFFECTIONATELY

DEDICATED,

BY HIS FRIENDS AND FORMER PUPILS,

T. H. T. AND A. M.

PREFACE TO THE FIRST EDITION.

THE following pages have been written with the view of presenting to the student and the practitioner of medicine a complete work on the Disorders of Infants and Children, within a moderate compass; together with such a series of observations upon the hygienic and general management of the young, as may lead to the prevention of much of the disease which now exists.

In performing my task, my aim has been always to avoid too great diffuseness; as well as to supply my readers with such facts as may lead them to think for themselves, rather than to overburden their memories with the various opinions of others.

10, CHARLOTTE STREET, BEDFORD SQUARE,
1 *February*, 1858.

PREFACE TO THE SECOND EDITION.

THE Author of the first Edition of this work being unable from the press of other engagements to prepare a second, that task has been by him entrusted to me, and I have undertaken it the more willingly in the belief that the work is a useful one. It is right I should add that I am solely responsible for all the alterations and additions in the present volume; and they are neither few, nor, as it seems to me, unimportant.

The general plan of the work has been entirely changed. I have divided it into four parts: the first treats of the Physiology and Pathology of Childhood, and includes chapters on the Anatomical and Physiological Peculiarities of Childhood, on Hygiene, Dentition, Pathology, Symptomatology, and Therapeutics.

Part II. treats of General Diseases, including all the varieties of Fever—Continued and Eruptive—and the several Diathetic Diseases —viz., Scrofula, Tuberculosis, Rickets, and Syphilis.

The Third Part considers all the Special Diseases of Children, arranged in their proper physiological order—viz,, Diseases of the Nervous, Respiratory, Circulatory, Digestive, and Urinary Systems; with Diseases of the Skin, Eye, and Ear.

In the Fourth Part I have discussed the more common Accidents, Injuries, Malformations, and Deformities—congenital and acquired— of Childhood, including those connected with birth.

Lastly, the Appendix of Formulæ has been much enlarged and re-arranged, though it must be confessed with regret that in the present state of therapeutics, any classification of drugs, though convenient in some respects, is more artificial and arbitrary than scientifically exact or trustworthy. The advances which are being made in this department of practical medicine will, it is hoped, before long lead to a sounder system of therapeutical classification.

Perhaps I may be permitted to direct special attention to the views I have advocated in regard to diathesis, and its importance in the therapeutics of infancy and childhood. Long experience and careful observation have convinced me that herein will be found the key to the successful treatment of most of the diseases of early life.

It is not necessary for me here to particularize the additions which have been made to the present volume, they are scattered throughout the work, and some new chapters have been introduced, while the whole has been carefully revised, and may, I trust, be considered fairly to represent the present state of our knowledge of this department of medicine, so far at least as that is possible in a work of this size.

In the performance of my task I have endeavoured to make the book as practically useful as possible, avoiding at the same time too great diffuseness and the obscurity which often arises from over-condensation; if I have succeeded in this, my hopes will have been realized.

In conclusion, I have to thank my friends Dr. Tilbury Fox and Mr. Robert Brudenell Carter for their kind assistance; the former in revising the chapter on Diseases of the Skin; the latter for having entirely re-written the chapter on Diseases of the Eye.

A. M.

George Street, Hanover Square,
March, 1870.

PREFACE TO THE THIRD EDITION.

A new edition of this work having been called for, I have gone carefully through it, and have endeavoured to make it represent as completely as possible our present knowledge of the subject. In carrying out this intention I have been most ably and kindly assisted by my friend, Dr. Venn, without whose help I could not, from the pressing emergencies of a busy life, have undertaken the task; but I trust the result has been to make the book still more acceptable to those for whose use and benefit it has been written.

The general plan of the work remains the same.

We have eliminated some material, and have added much more; so that the work is enlarged by about thirty pages.

The statistics have been carefully corrected by reference to the last Report of the Registrar-General for the year 1876.

Large additions have been made, and some entirely new sections written, on the Diseases of the Nervous System. Special reference may here be made to the sections on Cerebral Anæmia, Thrombosis of the Cerebral Sinuses, Cerebro-Spinal Meningitis, Spinal Congestion and Irritation, Pseudo-hypertrophic Muscular Paralysis, Progressive Muscular Atrophy, Hyperæsthesia, Neuralgia, and Chorea.

In the chapter on Respiratory Diseases, new sections have been added on Influenza, Spasmodic and Eczematous Asthma, and Nocturnal Cough, and much additional matter has been introduced on the subjects of Tubercular Meningitis, Croup and Diphtheria, Pneumonia, Pertussis, Typhlitis and Perityphlitis, Diseases of the Intestines, and Diabetes.

Throughout the work we have endeavoured to give the most recent views on Pathology and Treatment.

Lastly, the Index has been entirely re-written, and, being very copious, I trust it will be found useful for reference.

My thanks are specially due to my friend, Dr. Venn, for assistance of all kinds. If there be any credit due for the preparation of this edition it is largely his; for any faults, whether of omission or commission, I alone am responsible.

ALFRED MEADOWS.

27, George Street,
Hanover Square.

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APPENDIX OF FORMULÆ.

I. ALIMENTS.

Formula 1. *Extract of Beef.*

Take one pound of rumpsteak, mince it like sausage-meat, and mix it with one pint of cold water. Place it in a pot at the side of the fire, to heat very slowly. It may stand two or three hours before it is allowed to simmer, and then let it boil gently for fifteen minutes. Skim and serve. The addition of a small teaspoonful of cream to a teacupful of this beef tea renders it richer and more nourishing. Sometimes it is preferred when thickened with a little flour or arrowroot.

2. *Restorative Soup for Invalids.*

Take one pound of newly killed beef or fowl, chop it fine, add eight fluid ounces of soft or distilled water, four or six drops of pure hydrochloric acid, 30 to 60 grs. of common salt, and stir well together. After three hours the whole is to be thrown on a conical hair sieve, and the fluid allowed to pass through with slight pressure. On the flesh residue in the sieve pour slowly two ounces of distilled water, and let it run through while squeezing the meat. There will be thus obtained about ten fluid ounces of cold juice (cold extract of flesh), of a red colour, and possessing a pleasant taste of soup; of which a wineglassful may be taken at pleasure. It must not be warmed (at least, not to a greater extent than can be effected by partially filling a bottle with it, and standing this in hot water), since it is rendered muddy by heat or by alcohol, and deposits a thick coagulum of albumen with the colouring matter of blood.—If, from any special circumstance (such as a free secretion of gastric juice) it is deemed undesirable to administer an acid, the soup may be well prepared by merely soaking the minced meat in plain distilled water.—Children will frequently take the raw meat simply minced, when they are suffering from great debility. One teaspoonful of such meat may be given every three or four hours.

This modification of LIEBIG's *formula is very valuable in cases of continued fever, in dysentery, and indeed in all diseases attended with great prostration, and weakness of the digestive organs. When the flavour is thought disagreeable, it may be concealed by the addition of spice, or of a wineglassful of claret to each teacupful of soup.*

3. *Essence of Beef.*

Take one pound of gravy-beef, free from skin and fat, chop it up as fine as mincemeat, and pound it in a mortar with two tablespoonfuls of soft water. Then put it into a covered earthen jar with a little salt, cementing the edges of the cover with pudding paste. Place the jar in an oven or tie it tightly in a cloth and plunge it into a pot of boiling water for three hours. Strain off (through a coarse sieve, so as to allow the smaller particles of meat to pass) the liquid essence, which will amount to about two ounces in quantity. Give, two or more teaspoonfuls frequently. *In great debility, diphtheria, exhaustion from hæmorrhage, &c.*

4. *Liebig's Food for Infants and Invalids.*

Half an ounce of wheaten flour (that called "seconds" is the most suitable), an equal quantity of malt flour, 7¼ grains of bicarbonate of potash, and an ounce of water are to be well mixed. Add five ounces of cow's milk, and put the whole on a gentle fire. When the mixture begins to thicken it is to be removed from the fire, stirred for five minutes, heated and stirred again till it becomes quite fluid, and finally made to boil. After separating the bran by passing the mixture through a sieve it is ready for use.

To save the trouble of weighing, it may be remembered that a tablespoonful (heaped up) of wheaten flour weighs nearly half an ounce, and a heaped dessert-spoonful of malt flour is equal to the same. This soup is as sweet as milk; and, after boiling, may be kept for twenty-four hours without undergoing any change. This is an excellent food for infants who cannot be suckled. It is slightly aperient; so that children under one year of age can seldom take more than two meals of it in the day. Where there is a tendency to diarrhœa 20 grains of prepared chalk may be substituted for the potash. The proportion of blood-forming and heat-producing elements is the same as in women's milk (1 : 3.8); while the quantity of alkali is equivalent to that in human milk.

The solid parts of this food are sold, ready mixed in packets, by Mr. Hooper of Pall Mall East and Grosvenor Street, Mr. Cooper of 26, Oxford Street, as well as by many other chemists.

5. *Eggs, Cream, and Extract of Beef.*

Wash two ounces of the best pearl sago until the water poured from it is clear. Then stew the sago in half a pint of water until it is quite tender and very thick: mix with it half a pint of good boiling cream and the yolks of four fresh eggs, and mingle the whole carefully with one quart of good beef tea, which should be boiling. Serve. *This nourishing broth is very useful in many cases of lingering convalescence after acute disease.*

6. *Mutton or Veal Broth—Beef Tea.*

Take of mutton or veal or beef one pound and a half, cold water one quart, a little salt, and rice two ounces. Simmer for four hours, boil for a few minutes, strain and serve. Another excellent plan for making beef tea is as follows:—Take one pound of beef minced very fine, and put it into a common earthenware teapot with a pint and a half of cold water. Stand the pot on the hob, so that it may simmer for at least three hours. About three quarters of a pint of good beef tea will be thus obtained.

Beef tea as ordinarily made, and preserved meat-juice of all kinds, are palatable but not very nutritive drinks. A pint of fine beef tea contains scarcely a quarter of an ounce of anything but water. Nevertheless if these fluids are of small value as mere nutrients, perhaps the osmazome and salts they contain may possess the property (like tea and coffee) of diminishing the waste of the tissues. It has been proved that dogs die slowly if fed on bread and gelatine alone; but when greatly reduced by this diet they soon regain flesh and strength if two ounces of meat tea be daily added to it.

Gruel mixed with beef tea is nourishing. It is made thus:—Take two tablespoonfuls of oatmeal with three of cold water, and mix them thoroughly. Then add a pint of strong boiling beef tea (or milk); boil for five minutes, stirring well to prevent the oatmeal from burning; and strain through a hair sieve.—*An excellent simple restorative during convalescence from acute disease before solid food can be taken.*

6a. *Prepared Raw Meat.*

M. Yvon recommends the following formula:—Raw meat, eight ounces; sweet almonds, two and a half ounces; bitter almonds, a drachm and a half; white sugar, two and a half ounces. Make into a paste and add water, yolk of eggs, or milk.

7. *Tapioca and Cod Liver.*

Boil a quarter of a pound of tapioca till tender, in two quarts of water ; drain it in a cullender, then put it back in the pan ; season with a little salt and pepper, add half a pint of milk, and put over one pound of fresh cod liver cut in eight pieces. Set the pan near the fire to simmer slowly for half an hour, or a little more, till the liver is quite cooked. Press on it with a spoon, so as to get as much oil into the tapioca as possible. After taking away the liver, mix the tapioca. If too thick, add a little milk, then boil it a few minutes ; stir round, add a little salt and pepper, and serve.—ALEXIS SOYER. *Tapioca thus cooked is nourishing and easily digested.*

8. *The Bran Loaf.*

The formula used by Mr. CAMPLIN, in *Diabetes*, is as follows :—" Take a sufficient quantity (say two or three quarts) of wheat bran, boil it in two successive waters for ten minutes, each time straining it through a sieve, then wash it well with cold water (on the sieve), until the water runs off perfectly clear ; squeeze the bran in a cloth as dry as possible, then spread it thinly on a dish, and place it in a slow oven—if put in at night let it remain until the morning, when, if perfectly dry and crisp, it will be fit for grinding. The bran thus prepared must be ground in a fine mill, and sifted through a wire sieve of sufficient fineness to require the use of the brush to pass it through ; that which does not pass at first ought to be ground and sifted again, until the whole is soft and fine.

Take of this bran-powder three ounces troy, three fresh eggs, one ounce and a half of butter, and rather less than half a pint of milk ; mix the eggs with part of the milk, and warm the butter with the other portion ; then stir the whole well together, adding a little nutmeg and ginger, or any other agreeable spice. Immediately before putting into the oven, stir in first thirty-five grains of bicarbonate of soda, and then three drachms of dilute hydrochloric acid. The loaf thus prepared should be baked in a basin (previously well buttered) for about an hour or rather more.

Biscuits may be prepared as above, omitting the soda and hydrochloric acid, and part of the milk, and making them of proper consistence for moulding into shape.

If properly baked the loaves or biscuits will keep several days, but should always be preserved in a dry place, and not be prepared in too large quantities at a time.

9. *Iceland Moss and Quinine Jelly.*

Take of Iceland moss (Cetraria), and Irish moss (Chondrus crispus, Carragheen), each one ounce. Boil slowly for three-quarters of an hour in a pint and a half of milk, strain through muslin, and add three ounces of white sugar dissolved in one ounce of the compound tincture of quinia (equal to eight grains of the salt). A dessert-spoonful to be taken frequently in the course of the day. *In phthisis, tabes mesenterica, &c.*

10. *Lime Water and Milk.*

℞. Liquoris Calcis Saccharati, fl. drs 1—4 ; Lactis, ad fl. oz. 4. Mix. *This compound will sometimes be retained when all other food is ejected. As a variety, milk and soda-water, in equal proportions, may also be ordered.*

It may be well to remember that the addition of grs. 15 of Bicarbonate of Soda to the quart of milk not only prevents it from turning sour, but renders it more digestible.

11. *Artificial Ass's and Goat's Milk.*

Take half an ounce of gelatine, and dissolve it in half a pint of hot barley water. Then add an ounce of refined sugar, and pour into the mixture a pint of good new cow's milk.

Chop an ounce of suet very fine, tie it lightly in a muslin bag, and boil it slowly in a quart of new milk. Sweeten with white sugar, or a glass of any liqueur. *An excellent aliment in some cases of tabes mesenterica, &c., where the unpleasant odour of goat's milk prevents its being taken.*

12. *Bread Jelly.*

Take a quantity of the soft part of a loaf, break it up, cover it with boiling water, and allow it to soak for some hours. The water—containing all the noxious matters with which the bread may be adulterated—is then to be strained off completely, and fresh water added; place the mixture on the fire, and allow it to boil for some time until it becomes smooth; the water is then to be pressed out, and the bread on cooling will form a thick jelly. Mix a portion of this with sugared milk and water, for use as it is wanted.—Dr. CHURCHILL. *A good food for infants at the time of weaning, for children with acute disease, &c.*

13. *Nutritious Demulcent Drinks.*

Mix together half a pint of Mucilago Acaciæ, Mistura Amygdalæ, and pure milk; sweeten with sugar-candy or honey; and add one large tablespoonful of any wine. Allow the whole to be taken during the day.—Or a large pinch of isinglass may be boiled with a tumblerful of milk, half a dozen bruised almonds, and two or three lumps of sugar. To be taken warm once or twice in the day.

These drinks are very grateful in cases of tonsillitis, ulceration of the pharynx, &c.; also in some cases of debility, with irritability of the stomach, and a tendency to diarrhœa.

14. *Indian Sarsaparilla and Barley Water.*

℞. Syrupi Hemidesmi, fl. oz. 2; Glycerini, fl. oz. 1; Decocti Hordei, fl. oz. 9. Mix. Direct—*One tablespoonful to be taken frequently. An agreeable demulcent, slightly alterative, and diaphoretic mixture. Useful in the eruptive fevers, and in inflammations of the mucous membranes.*

II. ALTERATIVES.

15. *Iodine and Iodide of Potassium Mixture.*

℞. Iodi, gr. 10; Potassii Iodidi, gr. 20; Aquæ Destillatæ, fl. oz. 1. Mix. *Four or six drops three times a day in sweetened water; in bronchocele, enlargement of mesenteric glands, &c.*

16. *Iodide of Potassium.*

℞. Potassii Iodidi, gr. 3; Syrupi Papaveris, fl. dr. 1; Aquæ Pulegii, fl. drs. 7. Mix. *Take a teaspoonful three times a day. For an infant six months old.*

17. *Iodide of Potassium and Sarsaparilla.*

℞. Potassii Iodidi, gr. 8; Syrupi Sarsæ, Syrupi, āā fl. drs. 4. Mix. *Take a teaspoonful three times a day. Useful in pleurisy, &c., when we fear that effusion is taking place. For a child three years old.*

18. *Iodide of Potassium.*

℞. Potassii Iodidi, gr. 6—gr. 12; Aquæ, fl. drs. 12. Mix. Direct—"One teaspoonful—by measure—every four hours, in a small cup of weak tea, or of plain barley-water." *Valuable in some of the acute inflammatory affections of childhood:—in certain cases of croup it may be given as above, to an infant one year old.*

℞. Potassii Iodidi, gr. 15; Tincturæ Assafœtidæ, fl. drs. 1½; Tincturæ Senegæ, fl.

drs. 3 ; Syrupi Móri, ad fl. oz. 3. Mix. Label—"One teaspoonful every two, three, or four hours." *For a child about two years old, suffering from croup. Also in cases of infantile pneumonia.*

19. *Alterative and Diaphoretic.*

℞. Hydrargyri Subchloridi, gr. 2 ; Antimonii Tartarati, gr. ½ ; Potassæ Nitratis, gr. 20. Mix, and make 12 powders. Direct—*One to be taken every four hours. In some cases of pericarditis, meningitis, &c. For an infant six months old.*

20. *Alterative and Diaphoretic.*

℞. Hydrargyri Subchloridi, gr. 4 ; Pulveris Ipecacuanhæ Compositi, gr. 2. Mix, and divide into six powders. *One to be taken every six hours. For a child between eighteen and twenty-four months old.*

21. *Calomel and Tartar Emetic.*

℞. Antimonii Tartarati, gr. 1 ; Hydrargyri Subchloridi, gr. 3 ; Sacchari Albi, gr. 20. Mix, and divide into 12 powders. *One to be taken every four hours. In acute inflammation of the serous membranes, &c. For an infant twelve months old.*

22. *Grey and Dover's Powder.*

℞. Hydrargyri cum Cretâ, gr. 12 ; Pulveris Ipecacuanhæ Compositi, gr. 2. Mix, and divide into six powders. *One to be taken every night and morning.*

23. *Alterative and Tonic.*

℞. Vini Ferri, Syrupi Tolutani, āā fl. oz. ½ ; Liquoris Arsenicalis, min. 12 ; Aquæ Anethi, fl. oz. 1. Mix. (Erasmus Wilson.) *The dose for a child about two years old, is one drachm thrice daily, directly after the meals. Almost a specific in eczema infantile.*

24. *Cod-liver Oil and Arsenic.*

℞. Olei Jecoris Aselli, fl. oz. 2 ; Vitelli Ovi, 1 ; Liquoris Arsenicalis, min. 44 ; Syrupi, fl. drs. 2 ; Aquæ Fontanæ, q.s. ad fl. oz. 4. Mix. (Erasmus Wilson.) *The dose is a drachm three times a day, with or directly after meals.*

25. *Alterative and Antispasmodic.*

℞. Potassii Iodidi, gr. 8 ; Tincturæ Hyoscyami, min. 12 ; Tincturæ Assafœtidæ, fl. drm. 1—fl. drs. 3 ; Decocti Senegæ, ad fl. oz. 1½. Mix. Direct—*One teaspoonful to be taken every four hours. In the third stage of croup, in some cases of acute bronchitis, and in some forms of pneumonia, we have seen great benefit from this mixture. The dose is for a child between one and two years of age.*

26. *Alterative and Tonic.*

℞. Syrupi Ferri Iodidi, fl. drm. 1 ; Syrupi, fl. drs. 11. Mix. *Take one teaspoonful three times a day. In tabes mesenterica, scrofulous diseases, early stages of phthisis, &c.*

27. *Alterative and Tonic.*

℞. Ferri Iodidi, gr. 4 ; Glycerini, fl. drs. 4 ; Infusi Calumbæ, ad fl. oz. 3. Mix. *One or two teaspoonfuls to be taken three times a day. Uses as above.*

28. *Alterative and Tonic.*

℞. Tincturæ Iodi, min. 2; Tincturæ Ferri Perchloridi, min. 4; Aquæ Camphoræ, fl. oz. ½. Mix. *Make a draught to be taken three times a day. Uses as above.*

29. *Alterative and Tonic.*

℞. Potassii Iodidi, gr. 4; Ferri-Ammonio citratis, gr. 12; Tincturæ Hyoscyami min. 16; Aquæ Destillatæ, ad fl. oz. 1½. Mix. *One-eighth part to be taken three times a day, with the meals, in sweetened water.*

30. *Alterative and Diaphoretic.*

℞. Hydrargyri Subchloridi, gr. 4; Pulveris Ipecacuanhæ, gr. 2; Sacchari Albi, gr. 20. Mix, and divide into eight powders. *One of these powders may be given to a child twelve months old, every four hours. If the calomel irritates the bowels,* gr. ½ *of Dover's powders should be added to every third or fourth powder.*

31. *Grey Powder, Soda, and Magnesia.*

℞. Hydrargyri cum Cretæ, gr. 2; Sodæ Bicarbonatis, gr. 2; Magnesiæ Carbonatis, gr. 5. Mix. *Make a powder to be taken every other night. An alterative and aperient for children, where there is great acidity of the secretions.*

32. *Alterative and Tonic.*

℞. Potassii Iodidi, gr. 4; Ferri Ammonio-citratis, gr. 20; Syrupi Papaveris, fl. drs. 3; Infusi Quassiæ, fl. oz. 3. Mix. *Take one tablespoonful three times a day. For a child two years old, affected with scrofula, tabes mesenterica, &c.*

33. *Bromide of Ammonium.*

℞. Ammonii Bromidi, gr. 24; Aquæ, fl. oz. 2. Mix. *One teaspoonful in a small cup of sweetened tea three times a day. For an infant with hooping-cough.*

34. *Alterative and Tonic.*

℞. Hydrargyri Subchloridi, gr. 1; Quiniæ Sulphatis, gr. 2. Mix, and divide into four powders. *One powder to be mixed with sugar and given twice a day in severe cases of ophthalmia neonatorum.*

35. *Benzoic Acid.*

℞. Acidi Benzoici, gr. 20; Glycerini, fl. oz. ¼; Aquæ, ad fl. oz. 4. Mix. *A dessertspoonful to be taken three or four times a day. For a child five years old. Useful in jaundice from suppressed action of the liver, and in uræmia. It has also been recommended in some cases of incontinence of urine.*

III. ANTHELMINTICS.

36. *Scammony and Calomel.*

℞. Pulveris Scammonii Compositi, gr. 4; Hydrargyri Subchloridi, gr. 1; Pulveris Aromatici, gr. 4. Mix. *The powder to be taken at bedtime. A useful anthelmintic in threadworm, also a valuable purgative in certain cerebral affections. For a child five years old.*

37. *Jalap and Calomel.*

℞. Extracti Jalapæ, gr. 2 to 4 ; Hydrargyri Subchloridi, gr. 2. Mix. *The powder to be taken at bedtime. Uses as No.* 36.

38. *Kamela.*

℞. Pulveris Kamelæ, gr. 5 to gr. 10 ; vel Tincturæ Kamelæ, min. 10 to 20 ; Syrupi Aurantii, fl. drm. ½ ; Mucilaginis Tragacanthæ, fl. drm. 1 ; Aquæ, ad fl. oz. 1. Mix for a draught. To be taken early in the morning. For a child two to five years old. *A purgative should be administered four hours afterwards. Kamela is an orange red resinous substance found adhering to the capsules of the Rottlera tinctoria, and is imported from Madrid. It is strongly recommended for tapeworm.*

39. *Turpentine.*

℞. Olei Terebinthinæ, fl. drm. ½ to fl. drm. 1 ; Olei Ricini, fl. drs. 2 to fl. drs. 4 ; Mucilaginis Tragacanthæ ; fl. drm. 1 ; Syrupi Zingiberis, fl. drm. 1 ; Aquæ, ad fl. oz. 1—2. Mix. *Make a draught to be taken early in the morning. For a child three to seven years old. Useful in tapeworm, &c.*

40. *Kousso.*

℞. Cusso in pulvere, gr. 10 to gr. 20 ; Mellis Depurati, sufficient to make an electuary. Direct—*Half to be taken early in the morning, the remainder six hours afterwards. For a child three to seven years old. Useful in tapeworm.*

The Infusum Cusso may be taken alone, in doses of fl. oz. 1 to fl. oz. 2.

41. *Santonin.*

℞. Santonini, gr. 2—6 ; Sacchari Lactis, gr. 10. Mix. Make a powder, to be taken early in the morning, suspended in a tablespoonful of cream. The patient ought to have fasted 12 hours previously. For a child two to five years of age. The dose may be repeated daily for 8 or 10 days if necessary ; and its exhibition should be followed at the end of 6 hours by the administration of one or two teaspoonfuls of the compound decoction of aloes. A specific for the ascaris lumbricoides. Less useful for the tænia solium, and oxyuris vermicularis. The friends of the patient should be warned that after a few days the sight sometimes becomes perverted, so that objects seem to acquire a blue or yellow or some other colour. *The eighth or sixth of a grain of the resin of podophyllum added occasionally to the dose of santonin appears to increase its efficacy.*

42. *Pomegranate.*

℞. Decocti Granati Radicis, fl. drs. 2 to fl. oz ½ ; Spiritûs Ætheris, min. 5. Mix. *Make a draught to be taken every four hours till four or six doses have been taken. For a child five years old.*

43. *Pomegranate and Sabadilla.*

℞. Granati Radicis Corticis, gr. 5 to gr. 10 ; Pulveris Sabadillæ, gr. 1 to gr. 2 ; Pulveris Aromatici, gr. 10 to gr. 20. Mix, and divide into four powders, one to be taken every two hours till the whole is consumed. *For a child three to five years old. It is more active than the preceding. A saline purge should be given after the last dose.*

44. *Male Fern.*

℞. Extracti Filicis Liquidi, min. 10—20 ; Syrupi Zingiberis, fl. drm. ½—1 ; Mucilaginis Tragacanthæ, fl. drm. 1—2 ; Aquæ, fl. oz. 1—2. Mix. Make a draught. *For* *a child five to ten years old.* To be taken early in the morning; only liquid nourishment having been allowed the previous day. Four hours afterwards a purgative dose of castor oil or compound decoction of aloes should be administered. *Especially useful for destroying tapeworms.*

See also **Enemata.**

IV. ANTISPASMODICS.

45. *Ether Mixture.*

℞. Spiritûs Ætheris, min. 40; Spiritûs Chloroformi, min. 40; Tinctura Cardamomi Compositæ, fl. drs. 2; Spiritûs Myristicæ, fl. drm. ½; Olei Carui, min. 3; Mucilaginis Tragacanthæ, fl. oz. ½; Aquæ Menthæ Piperitæ, ad fl. oz. 4. Mix. Direct—*One or two teaspoonfuls to be taken every three or four hours, till relief is obtained. For a child two or three years of age. Useful in colic, flatulence, and spasm.*

46. *Antispasmodic and Sedative.*

℞. Spiritûs Ammoniæ Aromatici, min. 40; Spiritûs Ætheris, fl. drm. ½; Tincturæ Belladonnæ, min. 40; Acidi Hydrocyanici Diluti, min. 4; Syrupi, fl. oz. ½; Aquæ, ad fl. oz. 4. Mix. Direct—*One dessertspoonful to be taken every four or six hours. For a child three or four years of age. Useful in spasmodic diseases, pertussis, laryngismus stridulus, &c.*

47. *Sulphate of Zinc and Belladonna.*

℞. Zinci Sulphatis, gr. 8; Extracti Belladonnæ, gr. 2; Aquæ, fl. oz. 4. Mix. *Half an ounce four times a day.* (Dr. Fuller.) *For a child above three years of age with pertussis. Every other day the strength of the mixture may be increased in the proportion of one dose. The belladonna, it is said, can thus be gradually increased to doses of five grains without any mischief.*

48. *Astringent Antispasmodic.*

℞. Acidi Hydrochlorici Diluti, min. 4; Spiritûs Ætheris, min. 8; Aquæ Camphoræ, fl. drs. 3. Mix. *Make a draught to be taken every six hours. Recommended by* Dr. Stieglitz, *of St. Petersburgh, as a stimulant for a child, aged about five, suffering from typhoid fever.*

49. *Antispasmodic and Stimulant.*

℞. Acidi Nitrici Diluti, fl. drm. 1; Tincturæ Cardamomi Compositæ, fl. drs. 3; Syrupi Simplicis, fl. drs. 4; Aquæ, ad fl. oz. 4. Mix. *Take a dessertspoonful every four hours.* Sir Duncan Gibb *states that nitric acid is a specific in the treatment of hooping-cough, curing the disease in from two to fifteen days. He recommends this formula.*

50. *Antispasmodic and Sedative.*

℞. Tincturæ Digitalis, Tincturæ Lobeliæ, āā min. 12; Syrupi Croci, fl. drm. 1; Aquæ Cinnamomi, ad fl. oz. 2. Mix. *Take a teaspoonful every three or four hours. For a child a year old. As a substitute for antimony in some forms of pneumonia, bronchitis, &c.*

51. *Antispasmodic and Sedative.*

℞. Syrupi Rhœados, fl. oz. 1; Acidi Hydrocyanici Diluti, min. 1. Mix. *Take a teaspoonful two or three times a day. For an infant six months old. If it disagrees or produces head symptoms it must be discontinued.*

52. *Antispasmodic and Stimulant.*

℞. Spiritûs Ammoniæ Aromatici, Spiritûs Ætheris, āā min. 20 ; Syrupi Papaveris, fl. drs. 2 ; Aquæ Anethi, fl. drs. 10. Mix. *Take one or two teaspoonfuls every three hours. A valuable stimulant in certain low forms of fever, in convalescence from pulmonary affections, and in some spasmodic diseases. The smallest dose may be given to an infant three months old.*

53. *Antispasmodic and Stimulant.*

℞. Spiritûs Ammoniæ Aromatici, min. 8 ; Spiritûs Chloroformi, min. 8 ; Tincturæ Opii, min. 2 ; Misturæ Amygdalæ, Aquæ Carui, āā fl. oz. ½. Mix. *Take one teaspoonful two or three times a day. In flatulence with gastro-intestinal disturbance. For an infant between eight and twelve months of age.*

54. *Simple Antispasmodic.*

℞. Tincturæ Assafœtidæ, fl. drm. ½ ; Syrupi Rhœados, fl. oz. 1. Mix. *In flatulent colic, one teaspoonful may be given every hour until relief is obtained.*

55. *Sumbul and Ether.*

℞. Tincturæ Sumbulis, fl. drm. 1. ; Spiritûs Ætheris, fl. drm. ½ ; Aquæ Camphoræ, ad fl. oz. 2. Mix. Direct—*One or two teaspoonfuls to be taken every four hours. For a child two or three years of age.*

56. *Antispasmodic and Sedative.*

℞. Acidi Hydrocyanici Diluti, min. 3 ; Sodæ Bicarbonatis, gr. 10 ; Spiritûs Ætheris, min. 12 ; Syrupi Papaveris, fl. drs. 2 ; Aquæ destillatæ, fl. drs. 6. Mix. *One teaspoonful to be taken every 4 hours. For a child nine months old suffering from pertussis.*

57. *Antispasmodic and Sedative.*

℞. Acidi Hydrocyanici Diluti, min. 4 ; Spiritûs Ammoniæ Fœtidæ, fl. dr. ½ ; Tincturæ Hyoscyami, min. 20 ; Syrupi Aurantii, fl. drs. 2 ; Spiritûs Anisi, fl. drm. 1 ; Aquæ, fl. oz. 1. Mix. *Take a teaspoonful three or four times a day. Recommended by* Dr. James Reid *in laryngismus stridulus or spasm of the glottis. For a child one year old.*

58. *Antispasmodic and Sedative.*

℞. Tincturæ Assafœtidæ, fl. drm. ½ ; Oxymellis Scillæ, fl. drm. 1 ; Tincturæ Opii, min. 2 ; Syrupi Rhœados, ad fl. oz. 1. Mix. *One teaspoonful may be given every two or three hours for three doses.*

59. *Belladonna for Children.*

℞. Extracti Belladonnæ, gr. 1 ; Syrupi, fl. drs. 3 ; Aquæ, ad fl oz. 1½. Mix. *One or two teaspoonfuls to be taken three times a day. Valuable in incontinence of urine in children between three and seven years of age, where there is nervous irritability. A small belladonna plaster may also be applied over the sacrum.*

60. *Antispasmodic and Stimulant.*

℞. Spiritûs Ammoniæ Aromatici, fl. drm. ½ ; Spiritûs Chloroformi, min. 12 ; Tincturæ Assafœtidæ, fl. drm. 1 ; Aquæ Camphoræ, ad fl. oz. 3. Mix. *One tablespoonful to be taken every six hours. In diseases of the lungs and air passages after the subsidence of the acute symptoms, when an antispasmodic and stimulant is required.*

61. *Antispasmodic and Stimulant.*

℞. Spiritûs Ammoniæ Aromatici, fl. drm. ½; Spiritûs Chloroformi, min. 20; Tincturæ Assafœtidæ, fl. drm. 1—fl. drs. 2; Tincturæ Camphoræ Compositæ, fl. drm. ½; Aquæ Pulegii, fl. drs. 12. Mix. *One or two teaspoonfuls to be taken every four hours. In some cases of hooping-cough, laryngismus stridulus, and other convulsive affections.*

62. *Antispasmodic and Stimulant.*

℞. Spiritûs Ammoniæ Aromatici, Spiritûs Ætheris, āā fl. drm. ½; Acidi Hydrocyanici Diluti, min. 6; Tincturæ Opii, min. 4; Aquæ Camphoræ, fl. oz. 3. Mix. *One tablespoonful to be taken every four hours. In passive cerebral congestion, &c.*

63. *Antispasmodic and Stimulant.*

℞. Aquæ Anisi, fl. oz. 1; Mucilaginis Acaciæ, fl. oz. ½; Olei Terebinthinæ, fl. drm. ½; Syrupi, fl. oz. ½. Mix. *One or two teaspoonfuls to be taken every four hours.* (MAUNSELL and EVANSON).

V. ASTRINGENTS.

64. *Simple Astringent.*

℞. Aluminis, gr. 24; Extracti Conii, gr. 12; Syrupi Rhœados, fl. drs. 2; Aquæ Anethi, fl. oz. 3. Mix. *Take a dessertspoonful every four or six hours. For a child two or three years of age, suffering from pertussis, when all inflammatory symptoms have ceased.*

65. *Astringent.*

℞. Tincturæ Catechu Compositæ, fl. drs. 2; Syrupi, fl. drs. 2; Decocti Hæmatoxyli, fl. oz. 1. Mix. *Take a teaspoonful every four hours. For an infant one year old. Valuable in simple diarrhœa, or as a tonic during convalescence from any gastro-intestinal disorder. The only disadvantage of logwood is that the pink evacuations which it produces permanently stain the infant's napkins.*

66. *Aromatic Astringent.*

℞. Pulvis Cretæ Aromatici, gr. 20; Tincturæ Hyoscyami, min. 30; Infusi Krameriæ, fl. oz. 1½. Mix. *Take one or two teaspoonfuls three times a day. In the simple diarrhœa of an infant about one year old.*

67. *Aromatic Astringent and Sedative.*

℞. Acidi Gallici, gr. 10; Tincturæ Cinnamomi Compositi, fl. drm. 1; Tincturæ Opii, min. 3; Syrupi, fl. drs. 3; Aquæ Cinnamomi, fl. drs. 12. Mix. *Take a teaspoonful every six hours. In chronic diarrhœa. For a child one year old.*

68. *Aromatic Astringent.*

℞. Acidi Gallici, gr. 10 to gr. 20; Acidi Sulphurici Aromatici, fl. drs. 1 to 2; Tincturæ Cinnamomi, fl. drs. 2; Aquæ Destillatæ, ad fl. oz. 4. Mix. Make a mixture. *For a child five years old. A dessertspoonful to be taken every four hours.*

69. *Gallic Acid and Ipecacuanha.*

℞. Acidi Gallici, gr. 20; Pulveris Ipecacuanhæ, gr. 2; Syrupi, fl. drs. 3; Infusi Rosæ Acidi, ad fl. oz. 4. Mix. Make a mixture. *For a child five years old. A dessertspoonful to be taken every four hours. An invaluable astringent in hæmorrhage from the lungs, stomach, intestines, or kidneys.*

℞. Pulveris Cretæ Aromatici, gr. 30; Tincturæ Catechu Compositæ, fl. drs. 2; Tincturæ Opii, min. 3; Misturæ Cretæ, fl. drs. 10. Mix. *Take a teaspoonful three times a day. In simple diarrhœa. For a child eighteen months old.*

70. *Astringent and Sedative.*

℞. Pulveris Cretæ Aromatici cum Opio, gr. 20; Infusi Catechu Compositi, fl. drs. 12. Mix. *Take a teaspoonful three times a day. For a child one year old, with chronic diarrhœa.*

71. *Alterative and Astringent.*

℞. Olei Ricini, fl. drm. 1; Pulveris Acaciæ, Sacchari Albi, āā gr. 30; Tincturæ Opii, min. 3; Aquæ Cinnamomi, fl. drs. 11. Mix. *Take a teaspoonful every four hours. For a child one year old, suffering from dysentery. A similar mixture was found by Dr. Baly to be very valuable in the treatment of dysentery among the prisoners in Millbank Penitentiary.*

72. *Rhatany and Rhubarb.*

℞. Tincturæ Rhei, fl. drm. 1 to 2; Infusi Krameriæ, ad fl. oz. 4. Mix. *Make a mixture and order a tablespoonful to be taken every six or eight hours. For a child five to ten years old. A valuable astringent in common diarrhœa.*

73. *Rhatany and Matico.*

℞. Tincturæ Krameriæ, fl. drs. 2; Syrupi Papaveris fl. drs. 3; Infusi Maticæ, ad. fl. oz. 4. Mix. *For a child seven years old. Take a dessertspoonful every four hours. Useful in the diarrhœa of tuberculosis.*

74. *Ferruginous Astringent.*

℞. Tincturæ Ferri Perchloridi, fl. drm. 1; Syrupi Aurantii, fl. drs. 3; Aquæ Floris Aurantii, ad fl. oz. 4. Mix. Make a mixture. *A dessertspoonful to be taken three or four times a day. For a child five years old.*

75. *Cold as a Local Astringent.*

The best and cheapest freezing mixture is made with ice and common salt in equal parts. Any of the following, however, will prove useful :—

MIXTURES.	PARTS.	THERM. SINKS.
Hydrochlorate of Ammonia	5	From 50° to 10°
Nitre	5	
Water	10	
Nitrate of Ammonia	1	From 50° to 4°
Water	1	
Snow	2	From 32° to —4°
Common Salt	1	
Snow or Ice	12	From 18° to —25°
Common Salt	5	
Nitrate of Ammonia	5	

VI. BATHS.

76. *Temperature of Simple Baths.*

BATH.	WATER.	VAPOUR.	AIR.
The Cold	33° to 65° F.		
,, Cool	65° to 75°		
,, Temperate.	75° to 85°		
,, Tepid	85° to 92°.	90° to 100°	96° to 106°
,, Warm	92° to 98°.	100° to 115°	106° to 120°
,, Hot.	98° to 112°	115° to 140°	120° to 170°

77. *Iron, or Oak Bark, Baths.*

℞. Ferri Sulphatis, oz. ½; Aquæ, C. 4. Mix. *Especially useful for strumous and rickety children.*

℞. Quercûs Contusæ, lb. 1; Aquæ Calidæ, O. 2. Mix. Boil for half an hour, and add the strained decoction to three gallons of warm or tepid water. *To be used every morning. For delicate children, &c.*

78. *Salt-water Baths.*

℞. Salis Marini (vulgo, "Bay Salt"), lb. ½; Aquæ Tepidæ, C. 4. Mix. Make a sponge-bath, to be used every morning. *In general debility, &c. The surface of the body should be thoroughly rubbed with a flesh-brush and coarse towels.*

79. *The Turkish Bath.*

The general effect of a hot air bath is to increase the force and rapidity of the circulation, and to induce free perspiration; but if too hot or too prolonged the determination of blood to the skin and lungs becomes so great, that the brain suffers. There is then consequently a lowering of the circulation, with depressed nervous power. A temperature varying from 120° to 165° will usually suffice; while if the perspiration is efficient and continuous, and the sensation agreeable, the patient may remain in the calidarium from forty to sixty minutes. The bath is *useful* in removing local congestions, in clearing the pores and inducing a healthy condition of the skin and mucous membranes, in eliminating noxious matters from the blood, and in imparting a sense of elasticity and vigour to the system. It is *injurious* when there is any obstruction to the circulation, or when the heart or vessels are affected with fatty degeneration, or when there are any symptoms of disease of the nervous centres, or when there is a tendency to vertigo or syncope.

80. *Cold Affusion.*

The patient is seated in an empty bath, and from four to six buckets of cold water (about 40° F.) are poured over his head and chest from a height of two or more feet. He is then quickly dried, and replaced in bed. The colder the water and the greater the height from which it is poured, the more stimulating the effect. Affusion, as thus practised by Dr. Currie, proved very valuable in the treatment of typhus. It may be resorted to when the temperature of the body is permanently above its normal (about 98·4° F.) standard, when there is no feeling of chilliness, when the body is not wholly bathed in sweat, when there is not much irritability of the nervous system, and when there is great stupor. The effect is to lower the temperature, to lessen the frequency of the pulse and respiration, to render the tongue moist and soft, to diminish or remove the stupor, to procure sleep, and sometimes to produce a critical perspiration. It may be used every twenty-four hours if necessary.

When it is desirable to apply the Douche Bath to one or more of the joints it is only necessary to affix two or three yards of large-sized India-rubber tubing to the tap of a cistern. The patient must sit in an empty bath, into which the water may fall as it plays upon the limb.

81. *The Shallow Bath.*

The patient sits in a bath some six feet long, with a depth of water (temperature 60° to 80° F.) varying from eight to twelve inches. The extremities and trunk are well rubbed by an assistant, while water is gently poured over the head. The duration of the bath ought to vary from five minutes to three-quarters of an hour, until the temperature of the body is lowered. The colder the water and the shorter the stay in it, the more stimulating and less sedative will be the effect. This bath is less exciting than the cold affusion, and is chiefly indicated where the latter would be improper,—*i.e.*, where there is much nervous irritability.

82. *Acid Sponging.*

One part of vinegar is to be added to two or three of cold water, and the body well sponged with the mixture. Simple tepid water may sometimes be advantageously used. The patient being weak and unable to move, the sponging must be done by degrees :—*i.e.*, the arms, chest, back, and legs are to be rapidly washed and dried in succession. *In many cases of fever, inflammation, scarlatina, &c.*

VII. COUNTER-IRRITANTS.

83. *Carbonate of Copper Ointment.*

℞. Cupri Carbonatis, gr. 60 ; Adipis Preparati, oz. ½. Mix, to form an ointment. (Devergie.)—*In chronic eczema and impetigo of the scalp where stimulating applications are required.*

84. *Iodine Paint.*

℞. Iodi, gr. 40 to 60 ; Potasii Iodidi, gr. 30 ; Spiritûs Vini Rectificati, fl. oz. 1. Mix. *To be applied with a camel's-hair pencil. Very useful in many chronic pains, &c.*

℞. Iodi, Potassii Iodidi, āā gr. 20 ; Collodii, fl. oz. 1. Mix.

The officinal Linimentum Iodi may also be used, but it must be diluted with from three to six parts of spirit or glycerine or tincture of aconite.

85. *Blistering and Epispastic Papers.*

These papers of M. Albespeyre have long been used in this country with great advantage, though they are less appreciated than in France.

They consist of—an epispastic paper for dressing blisters ; a dulcifying paper for issues, causing neither smell nor pain ; and blisters formed of an adhesive cloth without a plaster.

The Epispastic Paper, for dressing blisters, is prepared of four degrees of strength, under the designation of No. 1 feeble, No. 1, No. 2, and No. 3. No. 1 feeble possesses the least strength, and is suitable as a dressing for persons of irritable temperament, and for children. No. 1 has rather more salve spread upon it, and is adapted for patients whose blisters have risen well. No. 2 is employed for those whose blisters do not draw sufficiently, and require stimulating. Whilst No. 3 possesses a still stronger power, and is used only in cases where the blister has a tendency to dry up. They all maintain an abundant discharge, without pain or heat ; prevent the formation of false membranes ; produce no irritation of the urinary passages ; and cause no disagreeable smell.

The blisters—applied by the adhesive black side—readily adhere to the skin, producing vesication in a few hours (twelve at the furthest) ; and, if necessary, the same piece put on four or five times always produces a blistering effect.

VIII. DIAPHORETICS.

86. *Nitre and Ipecacuan.*

℞. Potassæ Nitratis gr. 10, *vel* Potassæ Citratis, gr. 30 ; Vini Ipecacuanhæ, fl. drs. 1½ ; Syrupi Hemidesmi, fl. oz. 1 ; Decocti Hordei, ad O 1. Mix. *Half a teacupful to be taken every two or three hours. In severe catarrh with sore-throat. For a child five years old.*

87. *Antimony and Opium.*

℞. Vini Antimoniale, fl. drm. 1 ; Liquoris Ammoniæ Acetatis, fl. drs. 4 ; Extracti Opii Liquidi, min. 5 ; Aquæ Camphoræ, ad fl. oz. 6. Mix. *One tablespoonful three times a day. Each fluid drachm of the wine contains one-quarter of a grain of antimony. For a child five years old.*

88. *Citrate of Potash and Ammonia.*

℞. Potassæ Citratis, gr. 30 ; Liquoris Ammoniæ Acetatis, fl. drs. 4 ; Spiritûs Ammoniæ Aromatici, fl. drs. 2 ; Tincturæ Aconiti, min. 5 ; Aquæ, ad fl. oz. 4. Mix. *One dessertspoonful every four or six hours. In pneumonia and many other acute inflammations. Sometimes it is preferable to give only the Solution of Acetate of Ammonia diluted with water (one fluid drachm to two ounces), and take a tablespoonful.*

89. *Diaphoretic and Diuretic.*

℞. Pulveris Opii, gr. ⅛ ; Pulveris Ipecacuanhæ, gr. 1 ; Potassæ Nitratis, gr. 4. *Make a powder, to be taken every night at bed-time. An improvement on the ordinary Dover's powder. For a child seven years old.*

90. *Ipecacuan and Syrup of Poppies.*

℞. Vini Ipecacuanhæ, fl. drs. 2 ; Syrupi Papaveris, fl. drs. 3 ; Liquoris Ammoniæ Acetatis, fl. drs. 2 ; Spiritûs Ætheris Nitrosi, fl. drm. 1 ; Aquæ, ad fl. oz. 2. Mix. *One teaspoonful every two or three hours. In the early stage of fever, severe catarrh, bronchitis, and pneumonia.*

91. *Antimony and Ipecacuan.*

℞. Vini Antimoniale, fl. drs. 1½ ; Vini Ipecacuanhæ, fl. drs. 2 ; Syrupi Rhœados, fl. drs. 3 ; Liquoris Ammoniæ Acetatis, fl. drs. 2 ; Aquæ, ad fl. oz. 6. Mix. *A small tablespoonful every two hours. A depressing mixture for children two or three years of age.*

92. *Ipecacuan and Syrup of Poppies.*

℞. Vini Ipecacuanhæ, fl. drs. 2 ; Syrupi Papaveris, fl. drs. 3 ; Mucilaginis Tragacanthæ, fl. oz. 1 ; Aquæ, ad fl. oz. 3. Mix. *One teaspoonful every two or three hours. An infantile cough mixture.*

See also, EXPECTORANTS, AND STIMULANTS.

IX. DISINFECTANTS.

In the management of the various eruptive fevers and other contagious diseases, as well as in the dressing and treatment of wounds, injuries, &c., where offensive discharges exist, the employment of Disinfectants is often of great service. We therefore give the following as among the most useful of the class.

93. *Artificial Disinfectants.*

The most useful agents are—chloride of lime, quicklime, and permanganate of potash. In certain cases the perchloride of iron, sulphate of iron, ammonia, iodine, and chloride of zinc are applicable ; chlorine or sulphurous acid gas (obtained by burning a couple of ounces of flowers of sulphur in a pipkin), may be employed ; or powdered charcoal can be tried. The sulphide of carbon and Cleaver's "Terabine" are also excellent disinfectants.

No night-stool or bed-pan should be used, especially in hospitals, without its containing the solution of permanganate of potash, or some chloride of lime, or chloride of zinc, or carbolic acid, or half an ounce of tincture of iodine. The first has the advantage of not being corrosive ; but the last is one of the most efficacious.—To remove quickly any unpleasant smell from the sick room, dried lavender or cascarilla bark may be burnt ; while the door and window must be opened, so as to allow of a free current of pure air.

To disinfect linen and washing apparel they should be soaked in a mixture of two ounces of the solution of permanganate of potash to the gallon of water ; and afterwards in boiling water. Woollens, bedding, or clothing may be thoroughly purified by exposing them for about two hours, in an oven, to a temperature of 220° F.

94. *Chlorine Gas.*

As a fumigating agent, antiseptic, and disinfectant, chlorine stands unrivalled. The ingredients for producing it should be contained in saucers placed in the higher parts of the room, as the gas which is developed will descend by its density, and soon become mixed with the surrounding air. Dr. Faraday adopted the following method at the Millbank Penitentiary:—One part of common salt was intimately mixed with one part of the black or binoxide of manganese, and placed in a shallow earthen pan ; two parts of oil of vitriol previously diluted with two parts by measure of water, were then poured over it, and the whole stirred with a stick. Chlorine continued to be liberated from this mixture for four days.

Another plan for causing the free evolution of chlorine gas, is the addition of half a pint of hydrochloric acid mixed with a quarter of a pint of water, to a quarter of a pound of finely powdered black oxide of manganese. Whichever mode is adopted for producing this disinfectant, it is necessary while employing it that the doors, windows, and chimney of the room be kept carefully closed for some hours.

The Chlorides of Lime and Soda, when exposed to the air, gradually absorb carbonic acid and give off chlorine. Hence either of these salts can be used as disinfecting agents. Cloths, dipped in an aqueous solution of chloride of lime, may be hung up in an inhabited room to fumigate it ; the quantity of chlorine given off being too small to be mischievous. It was probably in reference to these salts, that Abernethy said of disinfectants,—"They are sometimes very useful, very useful indeed ; for they make such an abominable stink that the patient is obliged to have the windows opened."

95. *Permanganate of Potash.*

The permanganate of potash is an excellent disinfectant, and is the basis of Condy's Antiseptic Fluid. The latter is double the strength of the officinal Liquor Potassæ Permanganatis.

From 1 to 6 fl. drs. of the solution of permanganate of potash in one pint of water, may be applied to all kinds of suppurating sores. We have frequently ordered such a lotion with great benefit to destroy the horribly offensive odour of a malignant ulcer ; or for the same purpose in suppurating scalds and burns. The solution should be made only of such a strength, as to be borne without any pain or even uneasiness. It must be frequently syringed over the sores, since contact with lint and sponges decomposes it. Linen is stained by it, but the discoloration may be removed by sulphate of iron. As a wash for stinking feet, or for the removal of offensive odours from the hands after handling morbid specimens, &c., the liquor ought to be used in the proportion of one fluid drachm to the ounce of distilled water. To deprive night-chairs of offensive odour, a wineglassful of Condy's fluid should be mixed with two pints of fresh or salt water, and put into the pan previous to its use.

96. *Chloride of Zinc.*

Sir W. Burnett's Disinfecting Fluid consists of gr. 25 of this salt to water fl. drm. 1. For use, about one ounce of this solution is added to two pints of water. To disinfect a sick room, a piece of flannel three or four feet square is to be moistened with a solution thus made, and frequently waved through the air. Some of it should also be placed in the close-stools and bed-pans.

97. *Iodine.*

This agent has been recommended for disinfecting and deodorizing purposes by Wynn Williams, Campbell de Morgan, Nunn, and Richardson. Two hundred grains are placed in a common chip box and suspended over the patient's bed, or they may be put into a cup or saucer on the mantel-shelf. If desired, the metal may be at once volatilized and the vapour diffused through the apartment, by placing it on a heated fire-shovel. In rooms occupied by small-pox patients the air may be kept free from smell by using iodine in this manner,—probably the strongest proof which could be adduced of the value of this simple and manageable remedy.

X. DIURETICS.

98. *Ether and Ammonia.*

℞. Potassæ Nitratis, gr. 10 to 20; Spiritûs Ætheris Nitrosi, fl. drs. 2; Liquoris Ammoniæ Acetatis, fl. drs. 4; Aquæ Camphoræ, ad fl. oz. 4. Mix. *One tablespoonful three or four times a day. In the early stages of many febrile and inflammatory disorders.*

99. *Benzoate of Ammonia.*

℞. Ammoniæ Benzoatis, gr. 50; Syrupi Hemidesmi, fl. oz. ½; Aquæ, ad fl. oz. 6. Mix. *One tablespoonful three times a day. As a diuretic in dropsy. Also in catarrhal inflammation of the bladder with alkaline urine.*

100. *Squills, Digitalis, Broom, &c.*

℞. Potassæ Acetatis, gr. 60; Syrupi Scillæ, fl. drs. 2; Spiritûs Ætheris Nitrosi, fl. drs. 3; Tincturæ Digitalis, min. 36; Succi Scoparii, fl. drs. 6; Aquæ, ad fl. oz. 6. Mix. *One tablespoonful every six or eight hours. As a diuretic in dropsy dependent upon disease of the heart, liver, or peritoneum. For a child five years old.*

101. *Diuretic.*

℞. Tincturæ Scillæ, fl. drs. 2; Tincturæ Camphoræ cum Opio, fl. drs. 2; Liquoris Ammoniæ Acetatis, fl. drs. 4; Decocti Scoparii, ad fl. oz. 6. Mix. *One tablespoonful three times a day. Diuretic and diaphoretic. In dropsies unaccompanied by inflammation, and not due to renal disease.*

102. *Diuretic and Laxative.*

℞. Spiritûs Juniperi, fl. dr. 1; Potassæ Tartratis Acidæ, gr. 30; Decocti Scoparii, ad fl. oz. 4. Mix. *One tablespoonful three times a day.*

103. *Nitre, Juniper, and Ether.*

℞. Potassæ Nitratis, gr. 60 ; Spiritûs Juniperi, fl. drs. 1 to 2 ; Spiritûs Ætheris Nitrosi, fl. drs. 3 ; Decocti Chimaphilæ (Phar. Lond. 1851), ad fl. oz. 6. Mix. *One tablespoonful every six hours. A tonic and stimulating diuretic. In scrofula, atonic dropsies, catarrhal inflammation of the bladder, and some skin diseases. For a child five years old.*

104. *Digitalis, Squills, &c.*

℞. Potassæ Citratis, gr. 60 ; Tincturæ Scillæ, fl. drm. 1 ; Vini Colchici, fl. drm. 1 ; Liquoris Ammoniæ Acetatis, fl. drs. 2 ; Infusi Digitalis, fl. oz. 1 ; Aquæ Menthæ Piperitæ, ad fl. oz. 4. Mix. *One dessertspoonful three times a day. Diuretic and sedative. In some forms of dropsy with disease of the mitral valve. For a child five years old.*

105. *Taraxacum and Nitric Acid.*

℞. Acidi Nitrici Diluti, fl. drm. 1 ; Succi Taraxaci, fl. drs. 3 ; Decocti Taraxaci, ad fl. oz. 6. Mix. *One tablespoonful three times a day. Laxative, alterative, and diuretic.*

106. *Infantile Diuretic and Sedative.*

℞. Potassæ Nitratis, gr. 16 ; Tincturæ Digitalis, min. 8 ; Liquoris Ammoniæ Acetatis, fl. drs. 2 ; Aquæ Anethi, fl. drs. 6. Mix. *Take one or two teaspoonfuls every four hours. For a child one year old. In anasarca dependent on cardiac disease, and in some inflammatory affections.*

107. *Simple Diuretic.*

℞. Infusi Digitalis, fl. drs. 1½ ; Syrupi Mori, fl. drs. 6. Mix. *Take a teaspoonful every four hours. For a child two years old.*

XI. EMETICS.

108. *Mild Emetic.*

℞. Pulveris Ipecacuanhæ, gr. ¼ to gr. 1 ; Sacchari Albi, quantum placeat. Mix. *This is a certain and mild emetic which may be exhibited to the youngest infant, and repeated every twenty minutes, until vomiting takes place. After one year of age the dose may be doubled.*

109. *Mild Emetic.*

℞. Vini Ipecacuanhæ, Syrupi, āā fl. oz. ½. Mix. *Take half a teaspoonful to two teaspoonfuls frequently until vomiting is induced.*

110. *Antimonial Emetic.*

℞. Antimonii Tartarati, gr. ½ ; Syrupi, Aquæ, āā fl. oz. ½. Mix. *Take one to three teaspoonfuls frequently till vomiting occurs.*

111. *Slightly Stimulating Emetic.*

℞. Antimonii Tartarati, gr. 3 ; Oxymellis Scillæ, fl. oz. 1 ; Aquæ Fontanæ, fl. oz. 2. Mix. *A tablespoonful every quarter of an hour, for a child three years of age, suffering from croup.*

112. *Slightly Stimulating Emetic.*

℞. Vini Antimoniale, Oxymellis Scillæ, āā fl. oz. ½. Mix. *Take a teaspoonful frequently till vomiting occurs.*

113. *Depressing Emetic.*

℞. Vini Ipecacuanhæ, fl. oz. ½; Vini Antimoniale, fl. drs. 2; Oxymellis Scillæ, fl. drs. 2; Aquæ Destillatæ, fl. oz. 1. Mix. *One or two teaspoonfuls to be taken frequently until vomiting occurs. More certain and less violent than the preceding.* (Maunsell and Evanson.)

114. *Coxe's Hive Syrup.*

℞. Scillæ, Radicis Senegæ, āā oz. 1; Mellis, lb. ½; Aquæ, pint 1. Mix. Make a syrup, and add to each ounce one grain of Tartar Emetic. *Dose from ten drops to a teaspoonful every fifteen minutes, as an emetic; or every two or three hours as an expectorant. This compound is highly esteemed in America in the advanced stages of infantile bronchitis, croup, pertussis, &c..*

115. *Stimulating Emetic.*

℞. Cupri Sulphatis, gr. 2; Aquæ, fl. oz. ½. Mix. Signetur. *One-fourth part to be taken every quarter of an hour in barley water, until free vomiting takes place. For an infant one year old. The advantage of this emetic over sulphate of zinc is its tastelessness; it is valuable in the third stage of croup to aid in the removal of the false membrane..*

116. *Alum Emetic.*

℞. Aluminis, gr. 180; Syrupi, fl. oz. 1. Mix. Direct. *Half to be taken immediately, and the remainder in fifteen minutes unless vomiting be induced. Recommended by Dr. Meigs as one of the most certain emetics in croup. It does not produce prostration like antimony, nor does it act injuriously upon the gastro-intestinal mucous membrane.*

XII. ENEMATA.

117. *Purgative and Anthelmintic Enema.*

℞. Sodii Chloridi, gr. 120 to 180; Olei Olivæ, fl. oz. ½; Decocti Hordei, fl. oz. 3. Mix. *To destroy and cause the expulsion of thread-worms.*

118. *Purgative and Anthelmintic Enema.*

℞. Sodii Chloridi, gr. 120; Tincturæ Aloës, fl. drm. 1; Decocti Avenæ, fl. oz. 3. Mix. *Make an enema for a child five years old. Uses as above.*

119. *Steel and Aloes.*

℞. Tincturæ Ferri Perchloridi, fl. drs. 1 to 2; Extracti Quassiæ, gr. 5; Extracti Aloës Barbadensis, gr. 2; Infusi Quassiæ, fl. oz. 6. Mix. *To destroy oxyurides. For a child five to ten years old. A dose of scammony and calomel administered at the same time will do good.*

120. *Quassia.*

An enema of Infusum Quassiæ; *half a pint for a child five years of age is very useful in destroying the small thread-worms which collect often in the lower bowel near the anus, and give rise to much local irritation.*

121. *Purgative Enema.*

℞. Olei Ricini, Olei Terebinthinæ, āā fl. drs. 2; Tincturæ Assafœtidæ, fl. drm. ½; Decocti Avenæ, fl. oz. 4. Mix, and make an enema. *In obstinate constipation.*

122. *Purgative Enema for Flatulence.*

℞. Olei Ricini, fl. dr. 1½; Confectionis Rutæ, grs. 10; Decocti Hordei, ad fl. oz. 4. Mix. *Very useful when the intestines are distended with flatus.*

123. *Astringent Enema.*

℞. Argenti Nitratis, gr. 1; Aquæ Destillatæ, fl. oz. 3. Dissolve. *For a child one year old with inflammatory diarrhœa.*

Vel

℞. Extracti Krameriæ, gr. 15; Aquæ Destillatæ, fl. oz. 3. Dissolve. *For a child one year old. In inflammatory diarrhœa.*

124. *Enema of Assafœtida for a Child.*

℞. Tincturæ Assafœtidæ, min. 30; Decocti Hordei, fl. oz. 1½. Mix. *This may be administered night and morning, in cases where the stomach will not tolerate assafœtida.*

125. *Astringent Enema.*

℞. Olei Terebinthinæ, fl. drm. 1; Tincturæ Catechu Compositæ, fl. drm. ½; Tincturæ Opii, min. 2 to 3; Decocti Amyli, fl. oz. 1½. Mix and make an enema. *May be injected twice daily, in children between three and eight years of age, to check the purging in typhoid fever.*

126. *Sedative Enema.*

℞. Tincturæ Opii, min. 1 to 2; Decocti Amyli, fl. oz. ½. Mix. *For an infant one year old, suffering from urgent tenesmus, dysentery, &c.*

127. *Nutritive Enema.*

Cod-liver Oil, fl. drm. 1; Potassio-tartrate of Iron, gr. 10; Cow's milk, fl. oz. 1. Mix, *and administer night and morning.*

Vel

Strong Beef-tea, fl. oz. 4; Melted-butter, oz. ½; Port Wine, fl. drs. 2; Flour, gr. 120. Mix, *and administer as above.*

XIII. EXPECTORANTS.

128. *Stimulating Expectorant.*

℞. Vini Antimoniale, fl. drm. 1; Spiritûs Ammoniæ Aromatici, fl. drs. 1½; Syrupi Tolutani, fl. drm. 1; Tincturæ Camphoræ Compositæ, fl. drs. 2; Aquæ Camphoræ, fl. oz.-1½. Mix. *Take one or two teaspoonfuls every third or fourth hour. In those pulmonary affections of infants and children where we wish to administer tartar emetic without producing depression.*

129. *Senega and Squills.*

℞. Oxymellis Scillæ, fl. drs. 2 ; Syrupi Papaveris, fl. drs. 3 ; Vini Ipecacuanhæ, fl. drm. 1 ; Liquoris Ammoniæ Acetatis, fl. oz. ½ ; Decocti Senegæ, fl. oz. 1. Mix. *Take one or two teaspoonfuls every second hour. In pneumonia occurring during fever, or in a depressed constitution.*

130. *Expectorant and Sedative.*

℞. Vini Ipecacuanhæ, fl. drs. 1½ ; Tincturæ Scillæ, fl. drm. 1 ; Syrupi Papaveris, fl. drs. 3 ; Misturæ Acaciæ, ad fl. oz. 2. Mix. *Take one or two teaspoonfuls every third hour. In irritable cough with deficient expectoration.*

131. *Sedative Expectorant.*

℞. Pulveris Ipecacuanhæ Compositi, gr. 2 ; Pulveris Ipecacuanhæ, gr. ¼. Mix. *Make a powder to be taken at bedtime. For a child between four and six years.*

132. *Saline Expectorant and Diaphoretic.*

℞. Vini Ipecacuanhæ, min. 40 ; Liquoris Ammoniæ Citratis, fl. drs. 3; Aquæ Menthæ Viridis, ad fl. oz. 2. Mix. *Take one or two teaspoonfuls every four hours. In catarrh with mild fever.*

133. *Expectorant and Diaphoretic.*

℞. Potassæ Nitratis, gr. 12 ; Spiritûs Ætheris Nitrici, min. 20 ; Vini Antimoniale, fl. drm. ½ ; Tincturæ Camphoræ Compositæ, fl. drm. 1 ; Aquæ Anethi, fl. drs. 6. Mix. *Direct one drachm to be given every four hours in sugared water. For a child between one and two years of age, suffering from bronchitis.*

134. *Stimulating Expectorant.*

℞. Ammoniæ Carbonatis, gr. 8 ; Vini Ipecacuanhæ, fl. drm. 1 ; Tincturæ Senegæ, fl. drs. 2 ; Syrupi Rhœados, fl. drs. 3 ; Aquæ, ad fl. oz. 3. Mix. *One dessertspoonful every two or three hours. An excellent stimulating expectorant for young children recovering from croup. In hooping-cough where the bronchi are loaded with mucus.*

135. *Squills, Nitric Acid, and Bark.*

℞. Syrupi Scillæ, fl. drs. 2 ; Acidi Nitrici Diluti, fl. drm. 1 ; Tincturæ Hyoscyami, fl. drm. 1 ; Spiritûs Chloroformi, fl. drm. 1 ; Infusi Cinchonæ Flavæ, ad fl. oz. 4. Mix. *One or two teaspoonfuls twice or thrice daily. In chronic catarrh with debility and restlessness. For a child five years old.*

136. *Nitrous Ether, Ipecacuanha, and Hemlock.*

℞. Vini Ipecacuanhæ, fl. drm. 1 ; Spiritûs Ætheris Nitrosi, fl. drm. 1 ; Succi Conii, fl. drm. 1 ; Infusi Senegæ, ad fl. oz. 4. Mix. *One tablespoonful every six hours. In chronic bronchitis, when an expectorant and sedative is required. For a child five years old.*

137. *Benzoic Acid and Squills.*

℞. Acidi Benzoici, gr. 10 ; Syrupi Scillæ, Syrupi Rhœados, āā fl. oz. ½. *Make a linctus, of which one small teaspoonful is to be taken occasionally. In chronic bronchial affections. For a child five years old.*

138. *Expectorant and Stimulant.*

℞. Ammoniæ Carbonatis, gr. 1; Tincturæ Scillæ, min. 5; Sacchari Fæcis, fl. drm. ½; Decocti Senegæ, fl. oz. ½. Mix. *Make a draught, to be taken every second hour. An excellent stimulant expectorant for young children recovering from croup.*

139. *Stimulating Expectorant.*

℞. Ammoniæ Carbonatis, gr. 8; Tincturæ Scillæ, min. 16; Syrupi Tolutani, fl. drs. 4; Decocti Senegæ, fl. oz. 2. Mix. *Take one or two teaspoonfuls every four hours. For a child from one to four years of age, suffering from chronic bronchitis. The taste will be best disguised by administering it in water well sweetened with brown sugar.*

140. *Stimulating Expectorant.*

℞. Ammoniæ Carbonatis, gr. 6; Tincturæ Scillæ, fl. drm. ½; Syrupi Papaveris, fl. drs. 2; Decocti Senegæ, Aquæ Camphoræ, āā fl. drs. 6. Mix. *Take one or one teaspoonful every four hours. In chronic catarrh, the later stages of pneumonia, croup, &c.*

141. *Expectorant and Diaphoretic.*

℞. Vini Ipecacuanhæ, fl. drm. ½; Vini Antimoniale, min. 16; Tincturæ Camphoræ Compositæ, min. 20; Misturæ Amygdalæ, fl. drs. 7. Mix. *Take one teaspoonful every four hours. For infants one year old suffering from febrile disturbance, catarrh, &c.*

142. *Depressing Expectorant Mixture.*

℞. Vini Ipecacuanhæ, fl. drs. 2; Vini Antimoniale, fl. drm. 1; Oxymellis Scillæ, fl. drs. 1½; Liquoris Ammoniæ Citratis, fl. oz. ½; Aquæ Camphoræ ad fl. oz. 2. *Take one teaspoonful every four hours. In the early stage of acute bronchitis.*

143. *Expectorant and Stimulant.*

℞. Ammoniæ Carbonatis, gr. 1; Tincturæ Scillæ, min. 5; Sacchari Fæcis, fl. drm. ½; Decocti Senegæ, fl. oz. ½. Mix. *Make a draught to be taken every second hour. Very useful during the convalescence from croup.*

144. *Expectorant Mixture.*

℞. Vini Ipecacuanhæ, min. 20; Oxymellis Scillæ, fl. drm. 1; Spiritûs Ætheris Nitrosi, fl. drm. ½; Syrupi Papaveris, fl. drs. 2; Aquæ Anisi, fl. drs. 8. Mix. *Take two teaspoonfuls every three or four hours. For an infant one year old affected with catarrh.*

145. *Expectorant Mixture.*

℞. Potassæ Bicarbonatis, gr. 40; Acidi Citrici, gr. 20; Vini Antimoniale, Vini Ipecacuanhæ, āā fl. drm. 1; Syrupi Papaveris, fl. drs. 3; Aquæ Camphoræ, fl. oz. 2½. Mix. *Take two or three teaspoonfuls every third hour. For a child two years old.*

146. *Expectorant and Stimulant.*

℞. Tincturæ Assafœtidæ, fl. drs. 1½; Spiritûs Chloroformi, min. 20; Tincturæ Camphoræ Compositæ, fl. drm. 1; Decocti Senegæ, Aquæ Camphoræ, āā fl. oz. 1. Mix. *Take one or two teaspoonfuls every third hour. Very useful in bronchitis and pneumonia, when the acute symptoms have been subdued.*

147. *Expectorant and Anodyne.*

℞. Sodæ Bicarbonatis, gr. 10 ; Vini Ipecacuanhæ, fl. drs. 1½ ; Tincturæ Opii, min. 3 ; Syrupi Rhœados, fl. drs. 3 ; Aquæ Camphoræ, fl. oz. 1½. Mix. *Take one or two teaspoonfuls every second or third hour. In pneumonia or bronchitis with great irritability of the bowels.*

XIV. LINIMENTS, LOTIONS, OINTMENTS, AND OTHER EXTERNAL APPLICATIONS.

148. *Hydrocyanic Acid Lotions.*

℞. Acidi Hydrocyanici Diluti, fl. drs. 3 ; Plumbi Acetatis, gr. 60 ; Spiritûs Rectificati, fl. oz. 1 ; Aquæ Sambuci, ad fl. oz. 8. Mix. *In impetigo, prurigo, &c.*

℞. Liquoris Potassæ, fl. drs. 2 ; Acidi Hydrocyanici Diluti, fl. drs. 1½ ; Glycerini, fl. oz. 1 ; Aquæ Rosæ, ad fl. oz. 8. *In some cases of pityriasis.*

℞. Liquoris Ammoniæ Acetatis, fl. oz. 1 ; Acidi Hydrocyanici Diluti, fl. drs. 1½ ; Infusi Tabaci (made with sixty grains of Bird's-eye tobacco), ad fl. oz. 8. Mix. *To be sponged twice or thrice daily over the seat of irritation. In pruritus about the anus, vulva, &c.*

℞. Hydrargyri Corrosivi Sublimati, gr. 3 ; Acidi Hydrocyanici Diluti, fl. drs. 1½ ; Misturæ Amygdalæ, ad fl. oz. 8 ; Mix. *To check the irritation in prurigo and other skin diseases.*

149. *Astringent Lotions.*

℞. Glycerini, fl. oz. 1 ; Liquoris Plumbi Subacetatis, fl. drs. 2 ; Spiritûs Rectificati, fl. drs. 4 ; Aquæ Rosæ, ad fl. oz. 8. Mix. *In eczema, ecthyma, pityriasis, &c.*

℞. Zinci Sulphatis, gr. 16 ; Spiritûs Rosmarini, Tincturæ Lavandulæ Compositæ, āā fl. drs. 2 ; Aquæ, ad fl. oz. 8. Mix. *The common "Red Lotion" of Hospitals. Very useful for strumous and other ulcers.*

℞. Potassæ Chloratis, gr. 80 ; Aquæ, fl. oz. 8. Mix. *For many ill-conditioned ulcers.*

℞. Acidi Citrici, gr. 120 ; Aquæ, fl. oz. 8. Mix. *For cancerous sores. Also as a gargle in cancer of the tongue or tonsil. It relieves pain, and encourages cicatrization.*

150. *Iodine Lotions.*

℞. Tincturæ Iodi, fl. oz. 1 ; Glycerini, fl. drs. 12 ; Aquæ Destillatæ, ad fl. oz. 8. Mix. *For indolent and scrofulous ulcers, &c.*

℞. Linimenti Iodi, fl. drs. 4 ; Tincturæ Aconiti, fl. oz. ½ ; Aquæ Destillatæ, ad fl. oz. 8. Mix. *In some cases of chronic peritonitis ; chronic pleurisy with effusion ; chronic effusions into joints, &c.*

151. *Creasote, or Carbolic Acid, with Glycerine.*

℞. Creasoti, min. 35 ; Glycerini, fl. drs. 12 ; Aquæ, ad fl. oz. 8. Mix for a lotion. *In pityriasis, &c.*

℞. Acidi Carbolici, fl. drm. 1 ; Glycerini, fl. oz. 1 ; Aquæ, ad fl. oz. 8. Mix, for a lotion. *In pruriginous affections.*

152. *Corrosive Sublimate Lotion.*

℞. Hydrargyri Perchloridi, gr. 4 to 6 ; Aquæ Destillatæ, fl. oz. 3. Mix. *Useful in tinea favosa, and other parasitic skin diseases.*

153. *Sulphurous Acid Lotion.*

℞. Acidi Sulphurosi, fl. oz. 1 ; Aquæ Destillatæ, fl. oz. 7. Mix. *In skin diseases dependent on a parasitic plant.*

154. *Cold Lotions.*

℞. Liquoris Ammoniæ Acetatis, fl. oz. 1 ; Spiritûs Rectificati, fl. oz. 2 ; Aquæ Rosæ, ad fl. oz. 8. Mix. *As an evaporating lotion in inflammation of the membranes of the brain. To be applied after the scalp has been shaved.*

℞. Ammoniæ Hydrochloratis, oz. ½ ; Spiritûs Rectificati, fl. oz. 1 ; Acidi Acetici Diluti, fl. drs. 12 ; Aquæ, ad fl. oz. 8. Mix. *Use as above.*

155. *Absorbent Lotions.*

℞. Zinci Oxidi, gr. 160 ; Aquæ Rosæ, ad fl. oz. 8. Mix. *Useful in impetigo, eczema, &c.*

℞. Zinci Oxidi, gr. 160 ; Mucilaginis Tragacanthæ, Aquæ Destillatæ, āā fl. oz. 4. Mix.

156. *Solutions of Arnica.*

℞. Tincturæ Arnicæ, fl. drs. 1 to 6 ; Aquæ Destillatæ, ad fl. oz. 8. Mix. *As a lotion in sprains, contusions, and burns.*

℞. Tincturæ Arnicæ, fl. drs. 2 ; Tincturæ Belladonnæ, fl. oz. 1 ; Linimenti Saponis, ad fl. oz. 8. Mix, for an embrocation.

157. *Rubefacient Liniment.*

℞. Pulveris Capsici, gr. 30 ; Olei Macis, min. 30 ; Linimenti Terebinthinæ, fl. oz. 3 ; Linimenti Camphoræ Compositi, ad fl. oz. 8. Mix. *As a liniment to the chest in some cases of bronchitis.*

158. *Belladonna Liniment.*

℞. Linimenti Belladonnæ, fl. drs. 3 ; Glycerini, fl. drs. 5 ; Linimenti Saponis, fl. oz. 2. Mix. *The spine to be rubbed with this liniment night and morning for five minutes. In hooping-cough. May be used for a child five years old.*

159. *Stimulating Liniment.*

℞. Linimenti Camphoræ Compositi, fl. oz. 1½ ; Tincturæ Lyttæ, Tincturæ Opii, āā fl. drs 2. Mix, and make a liniment. *To be gently rubbed over the back of the chest in hooping-cough, infantile bronchitis, &c.*

Vel

℞. Linimenti Camphoræ Compositæ, Linimenti Saponis, āā fl. oz. ½. Mix. *To be rubbed over the thorax and spine, in cases of Atelectasis.*

160. *Embrocations for Chilblains.*

One ounce of bruised oak-galls should be boiled for an hour in two pints of water; the fluid, applied two or three times a day, forms a most efficacious remedy. The same result is obtainable by means of a decoction of oak-bark, or by a solution of half an ounce of tannic acid in 6 fl. oz. of water. If no ulcerations are present, we may also employ tincture of galls. Tannin as a hæmostatic and styptic, inducing no irritation or pain, is of the greatest service.

161. *Cod Liver Oil Embrocations.*

℞. Olei Morrhuæ, fl. oz. 3½; Spiritûs Ammoniæ Aromatici, fl. oz. 1; Tincturæ Opii, fl. drs. 4; Olei Lavandulæ, min. 30. Mix. *One half to be well rubbed over the chest and abdomen night and morning. In phthisis and other cases where the use of cod liver oil is indicated, but where the stomach will not bear it.*

℞. Olei Morrhuæ, fl. oz. 1; Olei Cajuputi, fl. drm. 1. Mix. *To be rubbed over the chest at bedtime. The cajuput oil well disguises the smell of this embrocation.*

162. *To remove Bruise Marks, "Black Eye," &c.*

A poultice made of black bryony-root (deprived of its bark and scraped) and bread crumbs or flour, should be enclosed in a thin muslin bag, and applied over the injured part. It will generally cause the ecchymosis to disappear within twenty-four hours, in a child. If the bryony-root cannot be procured, the poultice may be made with a solution of the hydrochlorate of ammonia. (Tyrrell.)

163. *Caoutchouc Solution.*

Take some thin pieces of Indian-rubber, or of pure gutta-percha, and dissolve them in chloroform. A good protective solution. *To be painted over superficial excoriations, threatened bed-sores, &c.*

164. *Collodium Paints.*

℞. Collodii, fl. oz. 1; Olei Palmæ, min. 20; Anchusæ Radicis, sufficient to give colour.—A good artificial cuticle, which when spread on the skin will not crack, may also be formed by mixing two parts of glycerine with one hundred of collodium. A similar preparation can be made with one part of collodium to two of castor oil.—*Either preparation may be used as a varnish in various cutaneous affections, excoriations, or superficial burns.*

165. *Glycerine and Lime Water.*

℞. Glycerini, fl. oz. 1; Pulveris Tragacanthæ Compositi, gr. 120; Mellis Depurati, gr. 120; Liquoris Calcis Saccharati, fl. oz. 1½; Misturæ Amygdalæ, ad fl. oz. 8. Mix. *A good bland embrocation in cases of herpes, superficial burns, chapped hands, excoriations, &c.*

℞. The officinal Linimentum Calcis—*Carron Oil*—consisting of equal parts of olive oil and lime-water, is also useful in some of the above-mentioned cases.

℞. Liquoris Calcis, Olei Amygdalæ, āā fl. oz. 1. Bene admisci et adde adipis preparatæ, 1 oz. Mix. *This ointment is more soothing than the Carron Oil, and is invaluable in irritable ulcers and sores from blisters, &c., in children.*

166. *Ammonia and Cantharides, &c.*

℞. Spiritûs Ammoniæ Aromatici, Spiritûs Rosmarini, Glycerini, āā fl. oz. 1; Tincturæ Cantharidis, fl. drs. 3 to 6; Aquæ Rosæ, ad fl. oz. 8. Mix. *To be gently* *brushed into the scalp night and morning, when the hair is falling off after fever or any severe illness.*

A more elegant preparation may be made by adding two fluid drachms of Tincture of Cantharides to two ounces of Eau de Cologne.

℞. Balsami Tolutani, gr. 120 ; Olei Rosmarini, min. 20 ; Tincturæ Cantharidis, fl. drs. 4 ; Olei Ricini, fl. oz. 1 ; Adipis Præparati, oz. 1. Mix. *A valuable pomade in cases of baldness following ringworm, pityriasis, or tinea decalvans. It should be brushed into the scalp night and morning.*

167. *Alum Coagulum.*

Take the whites of two eggs and shake them with fragments of alum to form a coagulum. *Useful when painted under the eyelid to produce contraction in trichiasis, entropion, &c.*

168. *Astringent Collyrium.*

℞. Aluminis, gr. 12 ; Aquæ Rosæ, fl. oz. 6. Dissolve and make an eye lotion.

Vel

℞. Zinci Sulphatis, gr. 6 ; Aquæ Rosæ, fl. oz. 3. Dissolve and make an eye lotion. *In ophthalmia tarsi, &c.*

Vel

℞. Zinci Sulphatis, gr. 16 ; Vini Opii, fl. dr. 1 ; Aquæ Rosæ, fl. oz. 8. Dissolve and make an eye lotion.

169. *Sedative Collyrium.*

℞. Extracti Belladonnæ, gr. 20 ; Aquæ, fl. oz. 6. Dissolve and strain through a piece of linen. *A piece of lint wetted with this lotion may be kept applied over the eye, in painful ophthalmia.*

Vel

℞. Hydrargyri Perchloridi, gr. 1 ; Atropiæ Sulphatis, gr. 2 ; Ammoniæ Hydrochloratis, gr. 8 ; Aquæ Rosæ, fl. oz. 8. Solve. *Recommended by* DR. MACKENZIE *as an eye-wash, in ophthalmia neonatorum when the cornea is ulcerated.*

170. *Iodide of Potassium Collyrium.*

℞. Potassii Iodidi, gr. 6 to 8 ; Aquæ Destillatæ, fl. oz. 1. Mix. *To remove stains of nitrate of silver from the conjunctiva.*

172. *Ammoniated Mercury and Sulphur.*

℞. Unguenti Hydrargyri Ammoniati, gr. 120 ; Unguenti Sulphuris, gr. 360. Mix. *A good anti-parasitic ointment.*

173. *Creasote and Red Oxide of Mercury.*

℞. Creasoti, min. 10 ; Unguenti Hydrargyri Oxidi Rubri, gr. 120 ; Unguenti Simplicis, gr. 360. Mix. *In parasitic diseases of the skin, the ulcerations of rupia, &c.*

174. *Diluted Citrine Ointment.*

℞. Unguenti Hydrargyri Nitratis, gr. 40 to 120 ; Unguenti Cetacei, gr. 240. Mix. *As a stimulant and alterative in chronic skin diseases. May be applied to the edges of the eyelids in ophthalmia to prevent their adhering at night.*

175. *Compound Spermaceti Ointments.*

℞. Acidi Hydrocyanici Diluti, fl. drm. 1 ; Unguenti Atropiæ, gr. 120 ; Unguenti Cetacei, oz. 1. Mix. *In cutaneous diseases attended with pain or itching.*

℞. Balsami Peruviani, fl. drs. 2 ; Unguenti Cetacei, oz. 1. Mix. *In slight excoriations.*

℞. Balsami Peruviani, fl. drs. 2 ; Unguenti Cetacei, oz. 2 ; Alkannæ Tinctoriæ Radicis, gr. 60 ; Olei Rosæ (Otto of Roses), min. 10. Mix. *Useful as a lip-salve, and as an application to chapped hands.*

176. *Iodine and Cod-Liver Oil Ointment.*

℞. Unguenti Iodi Compositi, Olei Morrhuæ, āā fl. drs. 4. Mix. *Useful when rubbed upon the throat in bronchocele ; as well as when applied to strumous glands, and the tumid bellies of children with mesenteric disease.*

177. *Bole Armeniac and Lead.*

℞. Boli Armenæ Rubræ, Plumbi Oxidi Semivitrei, āā gr. 30 ; Camphoræ, gr. 5 ; Ceræ Flavæ, gr. 180 ; Adipis Præparati, gr. 360. Mix. To be spread on thick linen. *Several German physicians speak of this as an efficacious application for preventing and curing bed-sores.*

178. *Iodide of Sulphur Ointments.*

℞. Sulphuris Iodidi, gr. 20 ; Unguenti Simplicis, oz. 1. Mix. *In acne, applied thrice daily.*

℞. Sulphuris Iodidi, gr. 12 ; Sulphuris Præcipitati, gr. 20 ; Olei Amygdalæ Amaræ, min. 5 ; Adipis Præparati, oz. 1. Mix. *Use as above.*

179. *Creasote and Sulphur Ointment.*

℞. Unguenti Creasoti, Unguenti Sulphuris, āā oz. ½. Mix. *In pityriasis, and some other chronic cutaneous affections.*

180. *Red Precipitate Ointment.*

℞. Hydrargyri Oxidi Rubri, gr. 10 to 30 ; Adipis Præparati, oz. 1. Misce bene, ut fiat unguentum. *Recommended by* DR. MACKENZIE, *in catarrhal ophthalmia, ophthalmia tarsi, opacity of the cornea, &c., applied along the edges of the eyelids.*

181. *Iodine Paint.*

℞. Iodi, gr. 60 ; Potassii Iodidi, gr. 30 ; Spiritûs Vini Rectificati, fl. oz. 1. Mix. *To be applied gently with a camel's-hair pencil. For young children this paint should be further diluted.*

182. *Iodine Ointment.*

℞. Unguenti Iodi, gr. 60 ; Adipis, gr. 120. Tere simul. *Useful when rubbed over the thyroid gland in bronchocele, or over enlarged scrofulous glands, or upon the tumid bellies of children suffering from mesenteric disease.*

Vel

℞. Potassii Iodidi, gr. 10 to 30 ; Adipis, 1 oz. Misce, fiat unguentum. *Useful as an application to strumous ulcers.*

183. *Benzoated Oxide of Zinc Ointment.*

℞. Adipis Præparatæ, oz. 6 ; Gummi Benzoini Pulveris, gr. 60. Liquefac, cum leni calore, per horas viginti quatuor, in vaso clauso ; dein cola per linteum, et adde Oxydi Zinci Purificati, oz. 1. Misce bene, et per linteum exprime.

For use, one ounce of this ointment is to be rubbed down with one drachm of spirits of wine, or spirits of camphor, or distilled glycerine, or liquor plumbi subacetatis, &c. *It is highly recommended by* **Erasmus Wilson**, *to alleviate the local distress, in infantile eczema, impetigo, &c.*

XV. NARCOTICS.

184. *Henbane, Camphor, and Hop.*

℞. Spiritûs Camphoræ, min. 4 ; Tincturæ Hyoscyami, Tincturæ Lupuli, āā min. 8 ; Mucilaginis Acaciæ, fl. oz. 1. Mix, make a draught. *For a child seven or eight years of age.*

185. *Morphia Draughts, &c.*

℞. Liquoris Morphiæ Hydrochloratis, min. 5 (= to gr. 1/24 of the salt) ; Syrupi Limonis, fl. drm. ½ ; Aquæ Camphoræ, fl. oz. ½. Mix. *To be taken at bedtime. In insomnia with pain. For a child nine years old.*

℞. Liquoris Morphiæ Hydrochloratis, min. 5 to 8 ; Spiritûs Chloroformi, min. 5 to 8 ; Spiritûs Ætheris, min. 5 ; Tincturæ Belladonnæ, min. 10 ; Tincturæ Cardamomi Compositæ, fl. drm. ½ ; Aquæ, ad fl. oz. ½. Mix. *To be taken at bedtime. For a child seven to ten years of age.*

℞. Liquoris Morphiæ Hydrochloratis, min. 30 ; Acidi Hydrocyanici Diluti, min. 12 ; Syrupi Scillæ, fl. drs. 4 ; Mucilaginis Acaciæ, fl. oz. 3 ; Aquæ Camphoræ, ad fl. oz. 6. Mix. *One dessertspoonful every three or four hours. In many irritable coughs. For a child five years old.*

186. *Chloroform and Opium.*

℞. Chloroformi, min. 3 ; Extracti Opii Liquidi, min. 1 to 2 ; Syrupi Rhœados, fl. drm. 1 ; Mucilaginis Tragacanthæ, fl. oz. 1. Mix, *for a night draught. In severe colic and other painful spasmodic disorders. For a child eight or nine years old.*

187. *Morphia, Chloroform, and Indian Hemp.*

℞. Liquoris Morphiæ Hydrochloratis, min. 5; Chloroformi, min. 2 ; Tincturæ Cannabis Indicæ, min. 5 ; Pulveris Tragacanthæ Compositi, gr. 5 ; Spiritûs Ætheris, min. 8 ; Acidi Hydrocyanici Diluti, min. 1 ; Aquæ, ad fl. oz. 1. Mix, *for a night draught. In many diseases attended with pain or restlessness. For a child seven years old.*

The medicine called **Chlorodyne** probably consists essentially of chloroform, Indian hemp, morphia, and hydrocyanic acid. In the *Canada Lancet* (15 October, 1864) **Dr. W. E. Bowman** gives the following formula for its preparation :— Take of Chloroform, half a fluid ounce ; Sulphuric Ether, ninety minims ; Oil of Peppermint, eight drops ; Resin of Indian Hemp, six grains ; Capsicum, two grains. Mix, shake occasionally, and allow it to stand for a few days. Take of Muriate of Morphia, sixteen grains, dissolved by the aid of heat in two fluid drachms of water ; to which when cold, add of Scheele's Hydrocyanic Acid, sixty-five minims; Perchloric Acid, one fluid drachm; Treacle, two fluid ounces. Add this gradually to the first mixture, and then make the whole measure four fluid ounces by the addition of treacle or water.—Each thirty minims contains chloroform, min. 4; ether, min. 1½; extract of hemp, gr. 1–10th, hydrochlorate of morphia, gr. ¼, and of Scheele's acid, min. 1. *The dose for a child five years of age is three to five drops.*

188. *Tolu and Camphorated Opium.*

℞. Tincturæ Tolutanæ, fl. drm. 1; Syrupi Tolutani, fl. oz. ½; Tincturæ Camphoræ Compositæ, fl. drm. 1 (= to gr. ¼ of opium); Mucilaginis Tragacanthæ, ad fl. oz. 6. Mix. *One tablespoonful three times a day. For a child five years old, where the mucous secretion from the bronchi is excessive.*

189. *American Hellebore.*

℞. Tincturæ Veratri Viridis (a saturated solution), min. 1—2; Aquæ, fl. oz. ½. Mix. This draught may be given every three or four hours until the pulse becomes sufficiently lowered or nausea is produced. The latter is readily counteracted by small doses of morphia. *It is a valuable arterial sedative: and is particularly used by American physicians in inflammations of the lungs, pleura, or peritoneum, and in acute rheumatism.*

190. *Stramonium and Henbane.*

℞. Tincturæ Stramonii, min. 30; Tincturæ Hyoscyami, fl. drm. 1; Tincturæ Cantharidis, fl. drm. ½; Spiritûs Chloroformi, fl. drm. 1; Aquæ, ad fl. oz. 3. Mix. *One-sixth part three times a day. In some cases of asthma, or other spasmodic pulmonary affection.*

191. *Opium and Ipecacuanha.*

℞. Vini Ipecacuanhæ, fl. drm. 1; Extracti Opii Liquidi, min. 12; Syrupi Tolutani, fl. drs. 2; Mucilaginis Tragacanthæ, fl. oz. 1. Mix. *One teaspoonful every two or three hours. In chronic cough. For a child five years old.*

192. *Henbane, Camphor, and Hop.*

℞. Spiritûs Camphoræ, min. 3—5; Tincturæ Hyoscyami, Tincturæ Lupuli, āā min. 10; Mucilaginis Acaciæ, fl. oz. ½. Mix. *For a draught to be taken at bedtime.*

193. *Opium and Sugar of Milk.*

℞. Pulveris Ipecacuanhæ cum Opio, gr. 1; Sacchari Lactis, gr. 120. Mix, and divide into four powders. *One to be taken every night, beaten up in a teaspoonful of cream. A safe opiate for infants from two to six weeks old.*

℞. Tincturæ Opii, min. 1; Sacchari Lactis, oz. ½; Mucilaginis Tragacanthæ, Aquæ Anethi, āā fl. drs. 4. Mix. *One teaspoonful twice or thrice in the twenty-four hours. In the painful diseases of early life.*

194. *Digitalis and Opium.*

℞. Acidi Sulphurici Aromatici, fl. drm. 1; Tincturæ Digitalis, fl. drm. 1; Extracti Opii Liquidi, min. 12; Infusi Chiratæ, ad fl. oz. 6. Mix. *One tablespoonful three times a day. For a child five years old.*

195. *Morphia and Squill Linctus.*

℞. Syrupi Scillæ, Syrupi Rhœados, āā fl. oz. 1; Liquoris Morphiæ Hydrochloratis, fl. drm. ½. Mix, and label—*A small teaspoonful to be taken frequently, if the cough is troublesome.*

196. *Compound Linctus.*

℞. Spiritûs Chloroformi, fl. drs. 2 ; Vini Ipecacuanhæ, fl. drs. 2 ; Liquoris Morphiæ Hydrochloratis, fl. drm. 1 ; Acidi Hydrocyanici Diluti, min. 12 ; Tincturæ Benzoini Compositæ, fl. drs. 2 ; Syrupi Mori, ad fl. oz. 3. Mix, and label,—*One teaspoonful every two or three hours, until the cough is relieved.*

197. *Anodyne Mixture.*

℞. Tincturæ Opii, guttam ; Syrupi, Mucilaginis Acaciæ, āā fl. oz. ½. Mix. *One teaspoonful every two or three hours. To an infant under two months ; not more than three successive doses should be administered : and when the desired effect has been produced, five or six hours should elapse before repeating its use.*

198. *Narcotic and Anodyne.*

℞. Tincturæ Camphoræ Compositæ, min. 16 ; Mucilaginis Acaciæ, Syrupi Rhœados, āā fl. drs. 2 ; Aquæ Camphoræ, fl. oz. ½. Mix. *One teaspoonful two or three times a day. A safe narcotic for the youngest infant, when the use of opium is indicated.*

XVI. PURGATIVES.

199. *Aperient and Alterative.*

℞. Pulveris Rhei, Sodæ Bicarbonatis, āā gr. 20 ; Infusi Calumbæ, fl. oz. 3. Mix. *Take a tablespoonful every morning. For children between three and six years of age.*

200. *Mild Aperient.*

℞. Infusi Rhei, fl. oz. 1½ ; Tincturæ Cinnamomi, fl. drm. 1 ; Potassæ Sulphatis, gr. 30 ; Syrupi Sennæ, fl. oz. ½. Mix. *Take two teaspoonfuls night and morning. In faulty digestion with torpidity of the bowels.*

201. *Aperient and Stimulant.*

℞. Potassæ Tartratis Acidæ, oz. ¼ ; Spiritûs Ammoniæ Aromatici, min. 20 ; Tincturæ Cardamomi Compositæ, fl. drm. 1 ; Extracti Glycyrrhizæ, gr. 20 ; Decocti Aloës Compositi, ad fl. oz. 2. Mix. *Take two to four teaspoonfuls occasionally. In laryngismus stridulus and other spasmodic diseases.*

202. *Simple Aperient.*

℞. Pulveris Rhei, gr. 20 ; Magnesiæ Carbonatis, gr. 40 ; Pulveris Cinnamomi, gr. 10. Mix. *Six grains may be given to an infant less than twelve months old. Afterwards from* gr. 10–20. *The cinnamon disguises the taste of the rhubarb.*

203. *Laxative for Infants at the Breast.*

℞. Magnesiæ Carbonatis, gr. 20 ; Syrupi Rosæ, fl. oz. 1. Mix. *One or two teaspoonfuls to be taken occasionally. In constipation with acidity.*

204. *Mild Laxative for Young Infants.*

℞. Potassæ Tartratis Acidæ, gr. 60 ; Mannæ Optimæ, oz. 1 ; Aquæ Destillatæ, fl. oz. 2½. Mix. This forms a rather palatable paste, which infants readily suck. *Gr.* 10–15 *may be given every morning.*

205. *Purgative Biscuits.*

℞. Jalap Powder, 60 grs. ; Flour, 4 oz. ; Moist Sugar, 6 oz. ; Ginger, 30 grs ; 4 Eggs. Mix, and divide into twelve biscuits. *One should be eaten once or twice a day, according to the effect desired.*

206. *Aperient and Alterative.*

℞. Tincturæ Jalapæ, min. 30 ; Tincturæ Rhei Compositæ, fl. drm. 1 ; Decocti Taraxaci, fl. drs. 7½. Mix. *Take two teaspoonfuls every morning. For an infant one year old, with constipation dependent on feeble peristaltic action of intestines.*

207. *Purgative Liniment.*

℞. Tincturæ Aloës, fl. oz. ½ ; Linimenti Saponis, fl. oz. 1. Mix. (DR. MERRIMAN.) *Effectual in keeping the bowels regular, if rubbed over the abdomen for five minutes daily.*

208. *Infantile Purgative.*

℞. Mannæ Optimæ, oz. ¼ ; Aquæ Anethi, fl. oz. 1. Mix. *When the meconium is retained, a teaspoonful may be given every hour until the bowels are opened.*

209. *A Common Purgative Mixture.*

℞. Misturæ Sennæ Compositæ, fl. oz. 1 ; Aquæ Menthæ Piperitæ, fl. oz. ½ ; Mannæ Optimæ, oz. ¼ ; bene commisce, cola, et adde Magnesiæ Carbonatis, gr. 20 ; Tincturæ Rhei fl. drm. 1 ; Syrupi Rosæ, fl. drs. 2. Mix. *One or two teaspoonfuls to be taken every two or three hours until the bowels are relieved.* (MAUNSELL and EVANSON.)

210. *Alterative, Purgative, and Diaphoretic.*

℞. Pulveris Jalapæ, gr. 30 ; Pulveris Ipecacuanhæ, gr. 5 ; Hydrargyri Subchloridi, gr. 5 to gr. 10 ; Sacchari Albi, gr. 10. Mix. *Two to six grains to be taken every third hour. In inflammatory affections, where it is desired to promote excretion.*

211. *Laxative and Alterative.*

℞. Sulphuris Sublimati, oz. 1 ; Theriacæ, fl. oz. 2. Mix. *One teaspoonful to be taken every morning. This nursery remedy is useful as a gentle stimulant to the intestinal mucous membrane, especially to that of the rectum. It also acts as a mild stimulant to the skin and secreting organs generally.*

212. *Mild Mercurial Purgative for Infants.*

℞. Hydrargyri cum Cretâ, gr. 10 ; Pulveris Rhei, gr. 20 ; Pulveris Cinnamomi Compositi, gr. 5. Mix. *Three to five grains to be taken every three hours till the bowels are well relieved.*

213. *An Effectual Purgative.*

℞. Pulveris Rhei, Pulveris Scammonii Compositi, Potassæ Sulphatis, āā gr. 10 ; optime tere simul et adde, Pulveris Cinnamomi Compositi, gr. 5. Mix. *Three to six grains to be taken every four hours till the bowels are well relieved. In croup, &c.*

214. *Purgative Oil.*

℞. Pulveris Scammonii, gr. 20; Olei Amygdalæ, fl. oz. 1; solve caloris mitioris ope, et adde, Pulveris Amygdalæ Compositi, oz. 1. Mix. *One or two teaspoonfuls to be taken occasionally.*

215. *Calomel and Scammony.*

℞. Hydrargyri Subchloridi, gr. 2 to gr. 3; Pulveris Scammonii Compositi, gr. 4; Pulveris Zingiberis, gr. 1. Mix, and make a powder. *A very valuable purgative in the head affections of children; also useful as an anthelmintic.*

216. *A Drastic Purgative.*

℞. Pulveris Scammonii Compositi, gr. 3 to gr. 8; Pulveris Cinnamomi Compositi, gr. 5. Mix. *Useful when there is torpidity of the abdominal viscera.*

217. *Another Drastic Purge.*

℞. Pulveris Jalapæ Compositi, gr. 5 to gr. 10. *In habitual costiveness, and in the dropsy which sometimes follows scarlatina.*

218. *Aperient and Alterative.*

℞. Sodæ Bicarbonatis, gr. 20; Tincturæ Rhei, fl. drs. 2; Infusi Calumbæ, Decocti Taraxaci, āā fl. drs. 7. Mix. *Two teaspoonfuls to be taken every night and morning. For a child one year old, suffering from dyspepsia, with offensive breath, acid eructations, sour evacuations, and constipation.*

219. *Calomel and Jalap.*

℞. Hydrargyri Subchloridi, gr. 1; Pulveris Jalapæ, gr. 5. Make a powder. *To be taken immediately; with the following draught three hours afterwards:—*

220. *Epsom Salts and Jalap.*

℞. Magnesiæ Sulphatis, gr. 20; Mannæ, gr. 20; Tincturæ Jalapæ, fl. drm. ½; Aquæ Carui, ad fl. oz. 1. Mix. *A good active purgative in head affections, &c., as well as at the commencement of many acute diseases. For a child ten years of age.*

221. *Epsom Salts and Sulphuric Acid.*

℞. Magnesiæ Sulphatis, gr. 30—40; Infusi Rosæ Acidi, fl. oz. 1. Make a draught. *To be taken early in the morning. In mild febrile affections with constipation. For a child seven years old.*

222. *Glauber's Salts and Sulphuric Acid.*

℞. Sodæ Sulphatis, gr. 30—60; Ferri Sulphatis, gr. ½—1; Acidi Sulphurici Diluti, min. 5; Tincturæ Hyoscyami, min. 15; Infusi Calumbæ, fl. oz. ½—1. Make a draught. *To be taken the first thing in the morning. In obstinate constipation with debility. For a child five to ten years old.*

223. *Glauber's Salts and Taraxacum.*

℞. Sodæ Sulphatis, gr. 20; Succi Taraxaci, fl. drm. ½; Decocti Taraxaci, fl. oz. ½. Make a draught. *To be taken every morning before breakfast. In constipation with deficient secretion of bile. For a child seven years old.*

224. *Aloes, Senna, and Jalap.*

℞. Tincturæ Sennæ, Tincturæ Jalapæ, āā fl. drm. 1; Infusi Sennæ, fl. oz. 1 ; Decocti Aloës Compositi, ad fl. oz. 3. Mix. *One dessertspoonful to be taken night or morning. For a child seven years old.*

225. *Sulphur and Magnesia.*

℞. Magnesiæ Carbonatis, gr. 10; Sulphuris Præcipitati, gr. 10; Sodæ Bicarbonatis, gr. 5 ; Pulveris Zingiberis, gr. 2. Make a powder. *To be taken early in the morning in a wineglassful of milk. A valuable aperient, especially in some skin diseases.*

226. *Purified Ox Bile.*

℞. Fel Bovini Purificati, gr. 1—2 ; Extracti Taraxaci, gr. 1—2. Mix. Make a pill. *To be taken at bedtime. Valuable as a purgative and cholagogue in cases of torpid liver, &c.*

227. *Podophyllum Peltatum, or May-apple.*

℞. Podophylli Resinæ, gr. ½ ; Pulveris Rhei, gr. 5 ; Extracti Hyoscyami, gr. 3. Make four pills. *One to be taken occasionally at bedtime. As a purgative in jaundice from suppression, in torpid liver, and in dropsy from cardiac or renal or hepatic disease. Podophyllin produces copious bilious stools ; but it is rather uncertain, and is apt to gripe unless combined with henbane.*

228. *Ammonia and Rhubarb.*

℞. Spiritûs Ammoniæ Aromatici, fl. drm. 1 ; Tincturæ Rhei, fl. drs. 2 ; Infusi Rhei, ad fl. oz. 3. Mix. *One-sixth part to be taken every morning. For a child five to seven years old.*

229. *Gentian, Ether, and Rhubarb.*

℞. Tincturæ Rhei, fl. drm. 1 ; Tincturæ Gentianæ Compositæ, fl. drs. 2 ; Spiritûs Ammoniæ Aromatici, Spiritûs Ætheris, āā fl. drm. 1 ; Aquæ Pimentæ, ad fl. oz. 2. Mix. *One dessertspoonful to be taken occasionally. In cases of colic or flatulence, where a warm stomachic aperient is needed.*

230. *Castor Oil.*

℞. Mucilaginis Tragacanthæ, fl. oz. ½ ; Aquæ Cinnamomi, fl. oz. 2 ; Olei Ricini, fl. drs. 4 ; Tincturæ Rhei, Syrupi Aurantii, āā fl. drs. 2 ; Tincturæ Opii, min. 6. Mix. *One-sixth part every three or four hours. In dysentery, when there are scybala in the rectum ; and where an aperient with a sedative is indicated. For a child five to seven years old.*

℞. Olei Ricini, fl. oz. 1 ; Olei Anisi, gt. 10 ; Chloroformi, gt. 10. Shake well and add Mucilaginis Acaciæ, fl. drs. 2. Make up with water. *In constipation. A third part three times a day.*

231. *Epsom Salts and Sulphate of Iron.*

℞. Magnesiæ Sulphatis, gr. 20 ; Ferri Sulphatis, gr. ¼ ; Acidi Sulphurici Diluti, min. 3 ; Extracti Quassiæ, gr. 4 ; Aquæ Pimentæ, fl. oz. ½. Make a draught. *To be taken early in the morning. In constipation and general debility. For a child seven years old.*

232. *Seidlitz Powder.*

℞. Sodæ Bicarbonatis, gr. 10 ; Sodæ et Potassæ Tartratis, gr. 30. Mix, and make an effervescing draught, with 8 grains of Tartaric or Citric Acid, dissolved in a wineglassful of water.

The **Effervescent Citrate of Magnesia**, in doses of a teaspoonful, in a claret-glassful of water, is a very agreeable and mild aperient.

233. *Rhubarb and Magnesia for Infants.*

℞. Pulveris Rhei, gr. 8 ; Magnesiæ Carbonatis, gr. 20 ; Aquæ Anethi, fl. oz. 1½. Mix ; *and order one teaspoonful to be taken every two or three hours until the bowels are freely acted on.*

XVII. REFRIGERANTS.

234. *Chlorate of Potash Mixture.*

℞. Potassæ Chloratis, gr. 15 ; Aquæ, fl. oz. 3. Mix. *Take a tablespoonful every four hours. For a child one year old affected uith stomatitis or with odontitis. It may be given in barley-water.*

235. *Refrigerant and Tonic Mixture.*

℞. Potassæ Chloratis, gr. 5 ; Tincturæ Cinchonæ Compositæ, min. 15 ; Tincturæ Camphoræ Compositæ, min. 5 ; Aquæ Anethi, ad fl. drs. 4. Mix. *Make a draught to be taken every four hours. For a child five years old, suffering from gangrenous stomatitis.*

236. *Mild Fever Mixture.*

℞. Potassæ Nitratis, gr. 30 ; Vini Ipecacuanhæ, fl. drm. 1 ; Syrupi Papaveris, fl. drs. 2 ; Aquæ Camphoræ, fl. drs. 10. Mix. *One or two teaspoonfuls to be taken every third hour.*

237. *Saline Mixture.*

℞. Spiritûs Ætheris Nitrosi, fl. drm. ½ ; Liquoris Ammoniæ Citratis, fl. oz. ½ ; Aquæ Camphoræ, ad fl. oz. 3. Mix. *One tablespoonful to be taken every four hours.*

238. *Fever Drink.*

℞. Potassæ Chloratis, gr. 30—gr. 60 ; Decocti Hordei, 1 pint. Mix, and make a drink. *A child under three years of age should be allowed only one-quarter to one-half of the pint.*

239. *Fever Drink.*

℞. Potassæ Nitratis, gr. 10—gr. 20 ; Decocti Hordei, 1 pint. Mix. *This may be taken during twenty-four hours when feverish symptoms predominate without any apparent cause.*

240. *Bicarbonate of Potash Drink.*

℞. Potassæ Bicarbonatis, gr. 30 ; Syrupi Limonis, fl. drs. 2 ; Aquæ, ad O ½. Mix, for the day's drink. *Very useful in the uric acid diathesis, in acute rheumatism, &c. A drink called "Constitution-water" owes its efficacy to the bicarbonate of potash it contains.*

241. *Cream of Tartar Drink.*

℞. Potassæ Tartratis Acidæ, oz. ½ ; Olei Limonis, min. 7 ; Sacchari Albi, oz. 1 ; Aquæ Bullientis, O 1. Mix. *To be used, when cold, as a common drink. In simple fever, with constipation and great thirst.*

242. *Hydrochloric Acid Drink.*

℞. Acidi Hydrochlorici Diluti, fl. drm. ½; Mellis Depurati, oz. ¼; Decocti Hordei, O ½. Mix, for daily drink. *In continued fever, &c.*

243. *Hydrochloric Acid and Chlorate of Potash Drink.*

℞. Acidi Hydrochlorici Diluti, fl. drm. 1; Potassæ Chloratis, gr. 80; Syrupi Zingiberis, fl. oz. ½; Decocti Hordei, O 1. Mix. *A valuable drink in some cases of fever.*

244. *Phosphoric Acid Drink.*

℞. Acidi Phosphorici Diluti, fl. drm. 1; Glycerini, fl. oz. ½; Decocti Hordei, O 1. Mix. *An efficacious drink for assuaging thirst in some diseases attended with nervous exhaustion. It has been recommended by* Dr. Paris *and* Sir Thomas Watson *as useful in diabetes; but according to* Griesinger *it positively increases the quantity of sugar excreted.*

245. *Chlorate of Potash Drinks.*

℞. Potassæ Chloratis, gr. 60; Syrupi Hemidesmi, fl. oz. 1; Aquæ, O 1. Mix. *In the eruptive fevers, some inflammations, &c.*

℞. Potassæ Chloratis, oz. ½; Potassæ Bicarbonatis, oz. ½. Mix, *and divide into eight powders. One to be dissolved in a pint of barley-water for the day's drink. In acute rheumatism.*

246. *Saline Draughts.*

℞. Sodæ Bicarbonatis, gr. 10; Aquæ Laurocerasi, min. 2; Syrupi Limonis, fl. drm. ½; Aquæ, ad fl. oz. ½. Mix. An effervescing draught is to be made by the addition of a dessertspoonful of lemon juice, or of eight grains of citric acid. *To be taken every four or six hours. In fever with nausea. For a child ten years old.*

247. *Saline and Diuretic.*

℞. Spiritûs Ætheris Nitrosi, fl. drm. 1; Liquoris Ammoniæ Acetatis, fl. drs. 3; Vini Colchici, fl. drm. ½; Aquæ Camphoræ, ad fl. oz. 4. Mix. *A dessertspoonful every four hours.*

248. *Refrigerant Mixture.*

℞. Syrupi Scillæ, fl. drs. 2; Spiritûs Ætheris Nitrosi, Tincturæ Hyoscyami, āā fl. drm. 1; Infusi Rosæ Acidi, ad fl. oz. 4. Mix. *One dessertspoonful every six hours. In influenza, catarrh, &c.*

249. *Saline Mixture.*

℞. Potassæ Nitratis, gr. 20; *vel* Potassæ Citratis, gr. 30; Vini Antimoniale, fl. drm. ½; Liquoris Ammoniæ Acetatis, fl. drs. 4; Aquæ Camphoræ, ad fl. oz. 4. Mix. *One dessertspoonful every four hours.*

250. *Saline with Excess of Ammonia.*

℞. Liquoris Ammoniæ Acetatis, fl. drs. 4; Spiritûs Ammoniæ Aromatici, fl. drm. 1; Syrupi Limonis, fl. drs. 2; Aquæ, ad fl. oz. 4. Mix. *One tablespoonful every four hours. In the early stages of fever, tonsillitis, &c.*

XVIII. STIMULANTS.

251. *Ammonia and Bitters.*

℞. Ammoniæ Carbonatis, gr. 12 ; Spiritûs Myristicæ, fl. drm. 1 ; Tincturæ Card momi Compositæ, fl. drs. 5 ; Infusi Caryophylli, ad fl. oz. 6. Mix. *One tablespoonfu every four or six hours. In debility with nausea and flatulence. Also in tonsillitis, scarle fever, &c.*

252. *Ammonia and Bitters.*

℞. Spiritûs Ammoniæ Aromatici, fl. drm. 1 ; Tincturæ Lupuli, fl. drm. 1 ; Tincturæ Gentianæ Compositæ, fl. oz. 1 ; Infusi Sennæ, ad. fl. oz. 6. Mix. *One tablespoonful twice or thrice daily. In phosphuria with constipation.*

253. *Ammonia and Bitters.*

℞. Spiritûs Ammoniæ Aromatici, fl. drm. 1 ; Aquæ Laurocerasi, min. 12 ; Sodæ Bicarbonatis, gr. 20 ; Tincturæ Calumbæ, fl. drs. 2 ; Aquæ Anethi, ad. fl. oz. 6. Mix. *One tablespoonful two or three times a day. To relieve nausea, or vomiting, with heartburn.*

254. *Ammonia in Effervescence.*

℞. Ammoniæ Carbonatis, gr. 60 ; Acidi Hydrocyanici Diluti, min. 4 ; Tincturæ Cardamomi Compositæ, fl. drs. 2 ; Infusi Aurantii, ad fl. oz. 6. Mix. *One tablespoonful to be made into an effervescing draught with one dessertspoonful of fresh lemon juice, or with six grains of citric acid. To be taken twice or thrice daily. In irritability of the stomach, with depression.*

255. *Ammonia in Effervescence.*

℞. Spiritûs Ammoniæ Aromatici, fl. drm. 1 ; Potassæ Bicarbonatis, gr. 60 ; Spiritûs Chloroformi, fl. drm. 1 ; Tincturæ Hyoscyami, fl. drm. 1 ; Infusi Cascarillæ, ad fl. oz. 6. Mix. *One tablespoonful every four hours, made into an effervescing draught with one dessert-spoonful of lemon juice. In irritable stomach with undue acidity of the secretions.*

256. *Ammonia and Ether.*

℞. Ammoniæ Carbonatis, gr. 12 ; Spiritûs Ætheris, fl. drm. ½ ; Infusi Caryophylli, ad fl. oz. 4. Mix. *One dessertspoonful three times a day. In debility with flatulence*

257. *Ether and Brandy.*

℞. Spiritûs Ætheris, fl. drm. 1 ; Spiritûs Vini Gallici, fl. drs. 6 ; Infusi Cinchonæ Flavæ, ad fl. oz. 6. Mix. *One tablespoonful every four or six hours. At the commencement of convalescence from many acute diseases. For a child eight years old.*

258. *Chloroform and Brandy.*

℞. Spiritûs Chloroformi, fl. drm. 1 ; Misturæ Spiritûs Vini Gallici, fl. oz. 4. Mix. *One dessertspoonful every six hours. In the low stages of fever with restlessness.*

259. *Sambul and Hop.*

℞. Tincturæ Sumbulis, fl. drs. 2 ; Infusi Lupuli, ad fl. oz. 6. Mix. *One tablespoonful three times a day. In cases where a stimulant and antispasmodic is required.*

XIX. TONICS.

260. *Quinine Mixture and Cod Liver Oil.*

℞. Tincturæ Quiniæ, fl. drs. 3; Infusi Aurantii Compositi, ad fl. oz. 3. Mix. *A dessertspoonful to be taken twice a day with one teaspoonful of cod-liver oil. In scrofulous diseases.*

261. *Quinine and Acid Mixture.*

℞. Quininæ Sulphatis, gr. 1 ; Acidi Sulphurici Diluti, min. 3 ; Syrupi Aurantii, fl. drm. ½ ; Aquæ fl. drs. 3½. Mix. *For a child seven years old. To be taken three times a day. Very useful in strumous ophthalmia, some forms of urticaria, and in almost all cases of debility.*

262. *Quinine and Iron.*

℞. Quiniæ Sulphatis, Ferri Sulphatis, āā gr. 3 ; Acidi Sulphurici Diluti, min. 8 ; Infusi Calumbæ, fl. oz. 2. Mix. *Two teaspoonfuls to be taken three times a day.*

263. *Quinine and Iron.*

℞. Ferri et Quiniæ Citratis, gr. 2 ; Tincturæ Calumbæ, min. 10 ; Infusi Calumbæ, ad fl. oz. ½. Mix. *Make a draught to be taken three times a day. An excellent tonic during convalescence from acute disease. For a child seven years old.*

264. *Citrate of Iron.*

℞. Ferri Citratis, grs. 12 ; Aquæ Destillatæ, fl. oz. 3. Mix. *A tablespoonful to be taken three times a day. For a child seven years old. A delicate chalybeate tonic in cases of anæmia.*

265. *Alkaline Tonic.*

℞. Ammoniæ Carbonatis, gr. 1—gr. 5 ; Potassæ Chloratis, gr. 5—gr. 10 ; Decocti Cinchonæ, fl. drs. 2—fl. oz. ½. Mix. *Make a draught to be taken three times a day. For children from two to twelve years of age, suffering from scurvy, gangrene of the mouth, &c.*

266. *Simple Tonic.*

℞. Extracti Cinchonæ Liquidi, fl. drm. ½ ; Tincturæ Cinchonæ Compositæ, fl. drs. 2; Aquæ Carui, fl. drs. 10. Mix. *One teaspoonful to be taken three times a day. For a child two years old.* DR. WEST *states that the taste of this mixture is best concealed by mixing it with twice the quantity of sweetened milk.*

267. *Tonic and Expectorant.*

℞. Tincturæ Scillæ, min. 30 ; Tincturæ Conii, min. 40 ; Tincturæ Calumbæ, fl. drs. 3; Infusi Cascarillæ, Misturæ Ferri Compositæ, āā fl. oz. 1. Mix. *Two teaspoonfuls to be taken three times a day. For a child about two years old, suffering from hooping-cough with anæmia. Also in convalescence from bronchitis, &c.*

268. *Quinine and Acid Mixture.*

℞. Quiniæ Sulphatis, gr. 3 ; Syrupi, fl. drs. 3 ; Infusi Rosæ Acidi, fl. drs. 13. Mix. *Two teaspoonfuls to be taken three times a day. For a child three to five years of age.*

269. *Muriatic Acid and Cascarilla.*

℞. Acidi Hydrochlorici Diluti, min. 12; Tincturæ Aurantii, Syrupi Aurantii, āā fl. drs. 1½; Infusi Cascarillæ, ad fl. oz. 1½. Mix. *Take one teaspoonful three times a day. For a child one year of age, with indigestion produced by insufficient secretion of the gastric juice.*

270. *Tonic.*

℞. Acidi Sulphurici Diluti, min. 15; Tincturæ Aurantii, Syrupi Aurantii, āā fl. drs. 2; Infusi Aurantii Compositi, fl. oz. 1½. Mix. *Take two teaspoonfuls three times a day. For a child with weak digestive powers.*

271. *Soluble Combination of Phosphate and Carbonate of Lime.*

℞. Calcis Phosphatis, gr. 120; Calcis Carbonatis, gr. 60; Sacchari Lactis, gr. 180. Mix. *Ten or twenty grains to be taken two or three times a day, in a little sweetened milk. Lactate of iron may be substituted for the sugar of milk in weak rickety children. In case of softening of the bones this remedy is thought by some authorities to be very valuable.*

272. *Iron and Calumba with Opium.*

℞. Ferri Sulphatis, gr. 4; Tincturæ Opii, min. 6; Syrupi, fl. drs. 2; Infusi Calumbæ, fl. drs. 10. Mix. *Take one teaspoonful every six hours. An astringent and chalybeate tonic. In chronic diarrhœa, in children two or three years of age.*

273. *Tonic and Purgative.*

℞. Tincturæ Ferri Perchloridi, fl. drm. ½; Extracti Glycyrrhizæ, gr. 30; Decocti Aloës Compositi, fl. oz. 1½. Mix. *Take one or two teaspoonfuls two or three times a day.*

274. *Bark and Ammonia.*

℞. Ammoniæ Carbonatis, gr. 12; Tincturæ Lavandulæ Compositæ, fl. drs. 2; Infusi Cinchonæ Flavæ, ad fl. oz. 6. Mix. *One tablespoonful every six hours.*

275. *Bark and Ammonia.*

℞. Ammoniæ Carbonatis, gr. 12; Tincturæ Aconiti, min. 6; Tincturæ Cinchonæ Flavæ, fl. drs. 2; Aquæ Menthæ Piperitæ, ad fl. oz. 6. Mix. *One tablespoonful three times a day.*

276. *Bark and Ammonia.*

℞. Ammoniæ Carbonatis, gr. 12; Extracti Opii Liquidi, min. 6; Spiritûs Ætheris, fl. drm. 1; Decocti Cinchonæ Flavæ, ad fl. oz. 6. Mix. *One tablespoonful every three or four hours. In cases where it is feared that a deposition of fibrin has taken place in the heart or one of the large vessels.*

277. *Bark, Ammonia, and Morphia.*

℞. Spiritûs Ammoniæ Aromatici, Spiritûs Chloroformi, āā, fl. drm. 1; Liquoris Morphiæ Hydrochloratis, fl. drm. ½; Extracti Cinchonæ Liquidi, fl. drm. ½; Tincturæ Cinchonæ Flavæ, ad fl. oz. 3. Mix. Direct, *One teaspoonful in a little water three times a day. In certain cases of phthisis this mixture is very useful, especially in conjunction with cod liver oil and a liberal diet.*

278. *Ammonia, Bark, and Rhubarb.*

℞. Spiritûs Ammoniæ Aromatici, fl. drm. 1; Extracti Cinchonæ Liquidi, fl. drm. ½; Tincturæ Rhei, fl. dr. 1; Infusi Rhei, ad fl. oz. 6. Mix. *One tablespoonful twice or thrice daily. In debility with constipation.*

279. *Bark and Liquor Potassæ.*

℞. Liquoris Potassæ, fl. drm. ½; Tincturæ Cinchonæ Compositæ, fl. drm. 1; Decocti Cinchonæ Flavæ, ad fl. oz. 3. Mix. *Two teaspoonfuls twice or thrice daily. In debility attended with acidity.*

280. *Acid and Bark.*

℞. Acidi Sulphurici Aromatici, fl. drm. ½; Syrupi Aurantii, fl. drs. 2; Tincturæ Cinchonæ Compositæ, fl. drs. 1½; Infusi Cinchonæ Flavæ, ad fl. oz. 6. Mix. *One tablespoonful twice or thrice daily, on an empty stomach. Especially useful in depressing disorders accompanied with general relaxation.*

281. *Acid and Bark.*

℞. Acidi Phosphorici Diluti, fl. drm. ½; Tincturæ Cinchonæ Compositæ, fl. drm. 1; Infusi Aurantii, ad fl. oz. 6. Mix. *One tablespoonful three times a day. In general debility.*

282. *Acid, Bark, and Nux Vomica.*

℞. Acidi Nitrici Diluti, *vel* Acidi Phosphorici Diluti, fl. drm. ½; Tincturæ Nucis Vomicæ, min. 12; Extracti Cinchonæ Flavæ Liquidi, fl. drm. ½; Aquæ Menthæ Piperitæ, ad fl. oz. 6. Mix. *One tablespoonful three times a day, two hours before each meal. In general weakness, with nervous exhaustion. For a child five years old.*

283. *Acid with Calumba, &c.*

℞. Tincturæ Calumbæ, fl. drs. 2; Acidi Sulphurici Aromatici, fl. drm. ½; Syrupi Aurantii, fl. drs. 4; Infusi Aurantii, ad fl. oz. 6. Mix. *One tablespoonful three times a day, when the stomach is empty.*

284. *Nitro-Hydrochloric Acid and Pareira.*

℞. Acidi Nitro-Hydrochlorici Diluti, fl. drm. ½; Tincturæ Belladonnæ, fl. drm. 1; Extracti Pareiræ Liquidi, fl. drm. 1; Decocti Pareiræ, ad fl. oz. 6. Mix. *One tablespoonful every six hours. In incontinence of urine, when the reaction of the latter is alkaline.*

285. *Quinine and Acid.*

℞. Quiniæ Sulphatis, gr. 4; Acidi Phosphorici Diluti, min. 20; Syrupi Aurantii, fl. drs. 4; Aquæ, ad fl. oz. 4. Mix. *One small tablespoonful three times a day. In strumous ophthalmia and other cases of debility.*

286. *Quinine, Steel, and Arsenic.*

℞. Tincturæ Quiniæ Compositæ, fl. drm. 1; Liquoris Arsenicalis, min. 6; Ferri et Ammoniæ Citratis, gr. 12; Aquæ Aurantii, ad fl. oz. 6. Mix. *One tablespoonful three times a day, after meals. In diseases of the skin &c., with impoverished blood.*

287. *Quinine and Iodide of Iron.*

℞. Tincturæ Quiniæ Compositæ, fl. drs. 2 ; Syrupi Ferri Iodidi, fl. drs. 4 : Infusi Calumbæ, ad fl. oz. 6. Mix. *One tablespoonful three times a day. In debility with a strumous taint, goitre, &c.*

288. *Cod Liver Oil.* (*Oleum Morrhuæ.*)

The oil most commonly used is of a pale straw colour, the dose varying from a teaspoonful to a dessertspoonful twice or thrice daily. It should be taken immediately after meals, floated on milk, coffee, beef-tea, orange wine, brandy and water, cherry brandy, &c. Chewing a piece of lemon-peel or cinnamon, or a few cloves previously, will disguise the flavour. Sometimes it is prefered in the form of an emulsion ; this may be made by beating up the oil with an equal proportion of lime water, or milk, or the yolk of an egg and some compound tincture of cardamoms.

Cod liver oil may be impregnated with various drugs—such as any of the essential oils, morphia, arsenic, iodine, mercury, quinine, zinc, iron, &c. Too large a quantity of the solution must not be made at a time, as the oil soon becomes rancid. Combined with ozone, it has been found to lessen considerably the frequency of the pulse in phthisis. The dose of ozonized oil, is from one to two drachms, two or three times a day.

289. *Iodide of Iron and Cod Liver Oil.*

℞. Syrupi Ferri Iodidi, fl. drs. 2—3 ; Mucilaginis Tragacanthæ, fl. oz. ½ ; Olei Morrhuæ, ad fl. oz. 3. Mix. *Two teaspoonfuls twice or thrice daily. In some forms of scrofula, phthisis, mild constitutional syphilis, &c.*

290. *Iodide of Potassium, Iron, and Cod Liver Oil.*

℞. Potassii Iodidi, gr. 12 ; Glycerini, fl. drs. 2 ; Vini Ferri, fl. oz. 1 ; Olei Morrhuæ ad fl. oz. 3. Mix. *A dessertspoonful to be taken twice a day. In chronic rheumatism, tertiary syphilis, strumous skin diseases, &c.*

291. *Steel and Glycerine.*

℞. Tincturæ Ferri Perchloridi, fl. drm. 1 ; Glycerini, fl. drs. 2 ; Aquæ, ad fl. oz. 6. Mix. *One tablespoonful every three or four hours. In diphtheria, erysipelas, &c.*

292. *Steel and Glycerine.*

℞. Spiritûs Ammoniæ Aromatici, fl. drm. 1 ; Ferri et Ammoniæ Citratis, gr. 24 ; Infusi Quassiæ, fl. oz. 4 ; Glycerini, fl. oz. 2. Mix. *One tablespoonful three times a day.*

293. *Steel and Arsenic.*

℞. Vini Ferri, fl. oz. 4 ; Liquoris Arsenicalis, min. 8—12 ; Syrupi Zingiberis, fl. oz. 2. Mix. *One tablespoonful three times a day immediately after meals. For cases of purpura. In reduced doses, as a tonic and alterative in some of the skin diseases of children.*

294. *Steel and Cantharides.*

℞. Tincturæ Cantharidis, fl. drm. 1 ; Glycerini, fl. oz. ½ ; Misturæ Ferri Compositæ, ad fl. oz. 4. Mix. *Two teaspoonfuls three times a day. In some forms of incontinence of urine.*

295. *Steel and Cantharides.*

℞. Tincturæ Cantharidis, Tincturæ Ferri Perchloridi, āā fl. drm. 1; Syrupi Hemidesmi, fl. oz. ½; Aquæ, ad fl. oz. 6. Mix. *One tablespoonful three times a day.*

296. *Steel and Chlorate of Potash.*

℞. Tincturæ Ferri Perchloridi, fl. drm. ½; Potassæ Chloratis, gr. 30; Liquoris Arsenicalis, min. 6; Aquæ, ad fl. oz. 6. Mix. *One tablespoonful three or four times a day. In certain skin diseases, onychia, &c. Also in anæmia dependent on a syphilitic taint, in erysipelas about the fauces, and in tonsillitis, &c., omitting the solution of arsenic from the mixture.*

297. *Phosphate of Iron.*

℞. Ferri Phosphatis, gr. 6; Pulveris Myrrhæ, gr. 6; Sacchari Albi, gr. 30. Mix, and divide into six powders. *One to be taken night and morning. In rickets, and other strumous diseases of children.*

A syrup of the Phosphates of Iron, Lime, Soda, and Potash has been prepared by MR. PARRISH, of Philadelphia. It may be obtained from most London Chemists; being known as "Chemical Food." *The dose for a child ten years of age, is one teaspoonful in water after the two principal meals of the day. This preparation is of great value in all forms of strumous disease and general debility.*

298. *Phosphorus and Oil.*

℞. Phosphori, gr. 1; Olei Morrhuæ, fl. oz. 6. Mix. *One or two teaspoonfuls three times a day, immediately after food. In tuberculosis, rickets, scrofula, &c.*

A

PRACTICAL TREATISE ON THE DISEASES OF INFANCY AND CHILDHOOD.

PART I.

ON THE PHYSIOLOGY AND PATHOLOGY OF CHILDHOOD.

CHAPTER I.

INTRODUCTORY REMARKS.

THE trite maxim, that—*a large and healthy population is the life and strength of a nation, and the source of its success in science, art, agriculture, and commerce*, can hardly be quoted too often: but though none probably will deny its truth, there are very many who will not act upon the precepts that such an observation ought to inculcate. It would indeed be well if our political economists could be led to believe, that in London and most of our large towns and cities, there are numerous gold mines, that only require working with energy and perseverance to yield a more satisfactory return even than the auriferous veins of Australia. Were the filthy streets and courts at present inhabited by so large a portion of the population swept away, and replaced by thoroughfares into which light and fresh air could freely penetrate, the Registrar-General's returns of deaths would be certainly lessened: while, with model lodging-houses and other healthy dwellings, many of the indigent would become useful and respectable members of society, instead of—as now—incumbrances upon the industrious. The *facilis descensus* has been tested by many a poor man, who driven from his miserable, ill-ventilated, and badly-drained home, has been led to seek a solace at the gin-palace; whence drink, idleness, and poverty have soon conducted him to the hospital, workhouse, or prison. The very usefulness of the poorer classes, as instruments for the creation of wealth and all the luxuries it procures, ought to be sufficient to make us mindful of their claims; and the most urgent of these claims is—that they be saved from all preventible disease. At present—to take only one example from many—scrofula, in one or other of its numerous forms or complications, runs riot; and by it the children of the poor are either prematurely cut off, or the seeds of future disease are sown, to bear subsequently an abundant harvest.

A lengthy statistical inquiry into the amount of mortality which occurs in infancy might be considered out of place in a treatise like this: at the same time, as the object of this work is to furnish information which, it is hoped, may be the means of saving life, some reference to this branch of our subject may be advantageously made. It may suffice to mention, that there is distinct evidence to prove that in the present day more than one-fourth—in the unhealthy districts of some large manufacturing towns, not less than one-third, and even a greater proportion—of all the children ushered into the world and ostensibly to live for threescore years and ten, are cut off within the first five years after birth: and if we may argue from past experience, there is little room to doubt that much of this mortality is due to the unhealthiness of the majority of the homes of the working classes; the unjustifiable use of stimulants, drugs, and quack medicines containing opium, &c.; the prejudices, neglect, and ignorance of nurses and parents; and to other preventible causes. So directly is infant life influenced by good or bad management, that less than a century ago the London workhouses presented the almost incredible result of twenty-three deaths in every twenty-four infants under one year of age! This frightful devastation was allowed to go on for a long time almost unnoticed, as it was deemed beyond the reach of remedy. But when, in consequence of a Parliamentary inquiry, an improved system of management was adopted, and the parish officers of London and Westminster were obliged to send their infant poor to be nursed in the country, the proportion of deaths was speedily reduced from 2,600 to 450 a year.

Mr. McCulloch, in his *Statistical Account of the British Empire,* quotes a table from the *Lancet* of 1835-36, showing the births and deaths under five years of age,—according to the London Bills of Mortality,—for 100 years, in five periods of twenty years each, and also the number dying under five years of age out of every 100 born. The results demonstrate that the mortality of children in London has been constantly on the decline. The table runs thus:—

	1730–49	1750–69	1770–89	1790–1809	1810–29
Total births . .	315,156	307,395	319,477	386,393	477,910
Total deaths under five years .	235,087	195,094	180,058	159,571	151,794
Dying per cent. under five years	74·5	63·0	51·5	41·5	31·8

Here it appears that in the 20 years, 1730-49, out of every 100 born, 74·5 died under the age of five years; while during the 20 years, 1810-29, the mortality was only 31·8 for the same number of children. If, then, half the children formerly cut off at an early age in England be now reared, it will appear—argues Mr. McCulloch, rather illogically—that a vast number of weakly children are annually introduced into the English population; and that unless we take proper means to fortify the constitution in manhood, the relative vigour will not increase in the same ratio as the population.

As late as 1838, Mr. Maclean, in his visit to St. Kilda, found that the population of that island was decreasing rather than increasing, owing to the excessive mortality at all times going on in infancy; "eight out of every ten children," he says, "die between the eighth and twelfth day of their existence." The principal cause of this terrible destruction of life, was the filth amidst which the inhabitants lived, and the noxious effluvia which pervaded their dwellings, owing to their being used during the winter months as store-houses for manure. The air of the island was good, the water excellent, and the clergyman, who lived exactly as his neighbours did, except as regarded the condition of his house, had a family of four children, all strong and healthy.

From the thirty-ninth Annual Report of the Registrar-General, for the year 1876, it appears that while the population of England numbered 24,395,660, the total number of births was 887,968, there being 452,278 males, and 435,690 females; the total number of deaths was 510,315, of which 265,076 were males, and 245,239 females. Of these deaths 206,553 occurred under the age of five years, in the proportion of 111,729 males to 94,824 females. These totals were made up of the following numbers at the several ages specified:—

TABLE OF DEATHS IN ENGLAND AT DIFFERENT AGES UNDER FIVE YEARS.

	Under 1 Year.	1	2	3	4	Under 5 Years.
Males . .	72,552	20,976	8,616	5,572	4,013	111,729
Females .	57,388	19,287	8,714	5,474	3,961	94 824
Total . .	129,940	40,263	17,330	11,046	7,974	206,553

Thus, more than half the deaths under the age of five years occur before the completion of the first year, and nearly one-fourth of all the deaths in England is made up of children under one year. Further it appears that scarcely more than three-fourths of all the children born survive the end of their fifth year, and nearly one-seventh succumb from various causes before the completion of their first year.

Again, if we limit the calculation to London we find that during the same year, 1876, the total population was 3,254,260: the births amounted to 127,444, of which 65,058 were males, and 62,386 females. The deaths at all ages amounted to 77,671, in the proportion of 40,071 males, and 37,600 females; 33,081 of these deaths occurred under the age of five years, and so on with the other ages under five, as shown in this table:—

Table of Deaths in London at different ages under five years.

	Under 1 Year.	1	2	3	4	Under 5 Years.
Males	11,038	3,594	1,547	978	628	17,785
Females . . .	8,916	3,284	1,545	911	640	15,296
Total. . . .	19,954	6,878	3,092	1,889	1,268	33,081

Hence again more than half the children who die under five years succumb before the end of the first year. Less than one-third of all the children born reach their fifth year, and considerably more than one-sixth never see the end of their first year.

But the most striking proof, probably, that can be given to show that infant mortality may be diminished by ordinary care, is to be found in the records of the Dublin Lying-in Hospital. It appears that, from the foundation of this hospital in 1757 up to 1783, the number of infants born alive in its wards amounted to 17,650, of which number 2,944 had died of convulsions, or what is commonly termed nine-day fits; so that, for the first twenty-five years this institution was open, nearly every sixth child died. Such excessive mortality prompted Dr. Joseph Clarke, on being appointed the Master, to seek minutely for its cause; and he was quickly led to infer that something defective existed in the construction of the building, preventing its perfect ventilation. This soon proved to be the case; for on the adoption of measures which rendered the wards more airy and more easily kept clean, the mortality at once diminished, until of 8,033 children born subsequently, only 419 died, that is about 1 in 19⅓, or from 5 to 6 in 100. Happily this rate of mortality has continued to diminish; for, during the Mastership of Dr. Collins, between the years 1825 and 1832, the total number of children born was 16,654, of which number 284 died previous to the mother leaving the hospital, or about 1 in 58½. This moderate mortality will appear almost trifling when it is considered that it includes not only all the deaths that occurred in children born prematurely, and in twins, but also every instance where the heart ever acted, or where respiration ceased in a few seconds after birth, and those whose death were attributed to their being "overlain," some of which were thought not to be accidental.

What then do these observations teach us? Simply this:—that disease and untimely death result not from necessity, or from chance, or accident, but really from the infringement of those laws and conditions, on the due observance of which the Creator has decreed that the health and welfare of the various organs of the body shall depend. As surely as we make sanitary improvements, so certainly will our yearly death-roll be diminished; while at no period of life will the decrease of mortality be more marked than in that of infancy. The essentials for securing infant health, in the great majority of cases, are few and simple. Pure air, cleanliness, suitable clothing, with plain and natural food, will do very much towards preventing disease; while prompt and skilful medical aid will equally assist the *vis medicatrix naturæ* in conquering those diseases which may be inevitable. The time has happily passed away, when physicians and surgeons felt an aversion to undertake the treatment of any severe infantile disorder: systematic knowledge has now taken the place of conjectural judgment, and with increased experience and practical skill, we now have greater confidence in the legitimate use of the remedies with which Nature has so bountifully supplied us. Hence, although our first exertions are to be directed towards the promotion of health and the prevention of disease by the means just noticed, and especially by so improving our large towns, that they may no longer be designated "the graves of mankind;" yet we must also be careful so to study our art, that we may be able successfully to cope with those disorders and accidents to which all organized beings are more or less subject, and which—in the present state of knowledge—seem unavoidable.

The following remarks—which, together with the Life-table, are compiled from the Registrar-General's *Fifth Annual Report*—embody some statistical results which possess very varied interest:—

Let us suppose that 100,000 children were born alive on the 1st January, 1841; and that they were the offspring of all ranks and classes of Englishmen. From the usual proportion of the two sexes registered, it will appear that 51,274 were boys, and 48,726 girls. Of the 100,000 children, 14,631 will have perished during the first year, leaving 85,369 alive on the 1st January, 1842: they were exactly a year old, and are placed against the age "1" on the table. On 1st January, 1843, the survivors were two years old, and in number 80,102; so that 5,267 have died in the second year. On 1st January, 1846, the fifth birthday was attained, and there were 74,201 living. Consequently, in the first five years, 25,799 children, out of 100,000, have died. During the next five years, when the children leave home more, and when—as it appears from the parliamentary returns—great numbers pass part of the day at school, the mortality becomes considerably less, so that we find 70,612 alive at the age of ten; while from ten to fifteen the loss is small, 68,627 living to the latter age. The loss of life among girls now becomes rather greater than among boys, and it continues so for the ensuing five years, when both sexes are more detached from the care of their parents, and the majority pursue the professions or trades by which they afterwards gain a livelihood. The mortality appears to increase rather rapidly from twelve to fifteen: and then at a slow, regular rate from the age of fifteen to fifty-five: 66,059 attain the age of twenty. It was stated that 51,274 boys were born alive to 48,726 girls; but the mortality in infancy is greater among boys than girls; so that 31,958 males attain the age of twenty-five, and 31,623 females attain the age of twenty-four. This is about the average age of marriage in England; and the number of the two sexes is then nearly equal. The chance of living from twenty-five to forty-five is rather in favour of English women; the violent deaths of men counterbalancing the dangers of child-bearing. At the age of sixty, 37,996 will be still alive; while 24,531 attain the age of seventy—*i.e.*, 11,823 men, and 12,708 women—the mortality of the latter being less than that of the former after fifty-five. At the age of eighty, there is but little doubt that about 9,000 of the 100,000 will still be found alive; but after this period the observations grow uncertain, although we may calculate that 1,140 will attain the age of ninety, 16 will be centenarians, and 1 man and 1 woman, out of the 100,000, may remain to complete their one-hundredth-and-fourth year.

For convenience of reference, these calculations are arranged in the following table, which also contains a register showing the *expectation of life*:—*i.e.*, the mean number of years which, at any given age, the members of a community, taken one with another, may expect to live. The *mean duration of life* is found by adding the age to the expectation of life:—thus, the mean duration of a boy's life at five years of age is $5 + 49{\cdot}64 = 54{\cdot}64$. The *probable duration of life* is the age at which a given number of children born into the world will be reduced one-half; so that there is an equal chance of their dying before or after that age. Thus, out of 51,274 males and 48,726 females—a total of 100,000 new-born infants—about one-half of each sex will have died before completing the age of 45; so that the probable lifetime of an infant at birth is 45 years.

LIFE-TABLE FOR ENGLAND.

Age.	Living.	Males.	Females.	Expectation of Life.		
				Persons.	Males.	Females.
0	100,000	51,274	48,726	41·16	40·19	42·18
1	85,369	43,104	42,265	47·13	46·71	47·55
2	80,102	40,388	39,714	49·19	48·82	49·57
3	77,392	39,018	38,374	49·89	49·52	50·29
4	75,539	38,064	37,475	50·11	49·74	50·48
5	74,201	37,385	36,816	50·01	49·64	50·38
10	70,612	35,564	35,048	47·44	47·08	47·81
15	68,627	34,573	34,054	43·74	43·35	44·13
20	66,059	33,324	32,785	40·34	39·88	40·81
25	63,295	31,958	31,337	36·99	36·47	37·52
30	60,332	30,473	29,859	33·68	33·13	34·25
35	57,172	28,867	28,305	30·40	29·83	30·99
40	53,825	27,145	26,680	27·14	26·56	27·72
45	50,301	25,311	24,990	23·86	23·30	24·42
50	46,621	23,376	23,245	20·55	20·02	21·07
55	42,796	21,355	21,441	17·16	16·68	17·63
60	37,996	18,808	19,188	14·00	13·59	14·40
65	31,852	15,589	16,263	11·20	10·86	11·52
70	24,531	11,823	12,708	8·78	8·51	9·03
75	16,664	7,867	8,797	6·74	6·53	6·92
80	9,398	4,316	5,082	5·07	4·92	5·20
85	4,021	1,780	2,241	3·75	3·64	3·83
90	1,140	481	659	2·74	2·68	2·77
95	174	69	105	2·13	2·22	2·06
100	16	7	9	...	...	...
104	2	1	1	...	...	...

This table reads thus:—Of 100,000 births, 51,274 will be male children, and 48,726 females; of which number 85,369 will be alive at the end of one year, or 43,104 males, and 42,265 females. So again of the 100,000, one male and one female will live to the age of 104.

To learn the expectation of life the table should be read as follows:—At birth a child's expectation of life is 41·16 years; if a boy, 40·19 years; if a girl, 42·18 years. Again, at the age of 40 a person's expectation of life is 27·14 years: hence the mean age to which persons who attain the age of 40 live is, 40+27·14=67·14 years.

With regard to the *sex of children* it may be interesting to the reader to learn, that although nothing positive is known, yet it seems probable that the differentiation is in some way influenced by the relative ages of the parents. The following table, by Mr. Sadler, indicates the proportion in Great Britain of male births to 100 females, under the conditions mentioned in the first column:—

Father younger than mother	86·5
Father and mother of equal age	94·8
Father older by 1 to 6 years	103·7
„ „ 6 to 11 „	126·7
„ „ 11 to 16 „	147·7
„ „ 16 and more	163·2

Thus it seems that the more advanced age of the fathers has a very decided influence in occasioning a preponderance of male children; and this tallies with what we know to be the case,—for, as a rule, in this country the husband is older than the wife, and the proportion of births is about 106 males to 100 females.

Some further statistics bearing upon this point may here be quoted, as they are both fuller in detail, and more numerous than the above, and are also less known; they are taken from a paper in the *Anthropological Review* for July and October, 1867, by Mr. C. O. Groom Napier, and the facts are gathered from the family statistics recorded in the peerages and baronetages of the United Kingdom.

PROPORTION OF MALE TO 100 FEMALE BIRTHS.

		Per cent.
390	Parents of equal age	91·8
276	Fathers one year older than the mothers	101·3
312	„ two to three years older	101·8
211	„ four to six years older	108·0
200	„ six to ten years older	130·1
168	„ ten to sixteen years older	144·3
120	„ seventeen to twenty-five years older	189·7
80	„ twenty-six to thirty-two years older	125·6
45	„ thirty-three to forty years older	112·6
18	„ forty to fifty years older (mothers under 25)	115·4
13	„ forty to fifty years older (mothers above 25)	91·6

MOTHERS OLDER THAN FATHERS.

88	from one to three years older	94·3
77	„ three to five years older	88·8
66	„ five to ten years older	77·1
43	„ ten to fifteen years older	60·6
17	„ fifteen to twenty-two years older	48·3

The author points out in reference to these figures that the proportion of male births continues to rise until it reaches 189 males to 100 females in the case of fathers from seventeen to twenty-five years older than the mothers. A greater preponderance in age of the fathers over the mothers showed a smaller proportion of male births; probably from diminished physical vigour in consequence of age in the male parent. This is especially seen in the cases quoted of 18 fathers from forty to fifty years older than mothers under twenty-five years of age, which gave 115 male to 100 female births. This percentage increased in the 13 fathers forty or fifty years older than mothers above twenty-five, whence the proportion is 91·6 male to 100 female births.

If the preponderance of age in male parents is favourable to a larger proportion of male over female births; that of females over males is also favourable for a similar increased proportion in female births. Thus, mothers from one to three years older than fathers gives a proportion of 94·3 male to 100 female births. Mothers from three to five years older than fathers gives a percentage of 88·8 males to 100 females. The proportion continues to increase until it reaches the greatly diminished rate of 48·3 males to 100 female births; but in this case the mothers are from fifteen to twenty-two years older than the fathers.

CHAPTER II.

ANATOMICAL AND PHYSIOLOGICAL PECULIARITIES OF INFANCY AND CHILDHOOD.

THERE is so intimate a relation between the anatomical and physiological characteristics of infancy and childhood, and the pathological tendencies of early life, that it will be well for us to devote some consideration to the former as a prelude to our remarks on the latter. For this purpose we shall regard the period of infancy as extending from the time of birth until the end of the second year, when the first dentition is generally completed: while the age of childhood will be supposed to comprehend two epochs; the *first*, extending from the termination of the second year to the end of the seventh or eighth, the time at which the second dentition is being terminated; and the *second*, reaching from the end of the first epoch to puberty —*i.e.*, consisting of the period of life between about the eighth and fourteenth or fifteenth year, and which is commonly known as girlhood or boyhood. Hence, adopting the old Aristotelian division of human life into three stages—growth, maturity, and decline—we have the first comprehended under the head of infancy and childhood.

The complexity and completeness of man's body, the variety of its parts, the diversity of its functions, and the high faculties of sense and intellect with which it is crowned, have in all ages been themes on which writers have loved to dilate; and the ancient opinion, that man was a microcosm, "an abstract or model of the world," seems, on consideration, almost justified. However this may be, it is certainly no poetical fiction to regard the infant as physically the abstract of the man; there are the same organs as in the adult, though they differ in their anatomical structure, and are remarkable for their imperfect development; there are also the same processes of waste and repair, of growth and decay, continuously going on.

But there are some important structural differences between infancy, childhood, and adult life, the chief of which are these: in the first place the tissues generally are softer, more vascular, and contain a good deal more fluid than in after-life; the glandular, lymphatic, and capillary systems are extremely active; the skin and mucous membranes are more delicate, soft, and sensitive; the brain is large and vascular, though so soft as to be almost fluid; and there is excessive nervous excitability, due rather to feebleness and consequent want of controlling power and to excessive reflex sensibility. The term of childhood being essentially the period of growth, the organs of alimentation are those which are the most fully developed; and they are also those which are the most actively employed; indeed, it may be said that at this age the functions are confined almost exclusively to nutrition.

As regards the *general appearance* of the new-born infant, it may be remarked first that its length varies from about 16 to 22 inches; the average length, probably, being between 18 and 19 inches, though Roederer states it to be 20½ inches. M. Quetelet's interesting deductions as to the growth of human stature, are as follows:—1. The growth is most rapid immediately after birth, amounting in the first year to nearly eight inches. 2. The growth diminishes as the child advances towards the fifth year; thus, during the second year the increase is only half what it was the first, while, during the third year, it is not more than one-third. 3. After the fourth or fifth year, the stature increases pretty regularly—about two inches annually—until the age of sixteen. 4. After puberty the stature increases slightly—about one inch a year—until the age of twenty-five, when it seems to be completed. The annual growth of the female is less than the male, and her development is completed earlier.

The mean weight of the newly-born infant is on an average about 7lbs. avoirdupois, or one-twentieth that of an adult. Dr. William Hunter states that of many thousand new-born perfect infants weighed at the British Lying-in Hospital in London by Dr. Macaulay, the smallest was about 4lbs., and the largest 11lbs. 2oz., while the greater number varied from 5 to 8lbs. The average weight of 26 children at the natural period, weighed by Roederer, was about 6½lbs.; the lightest 5½lbs., and the heaviest 8lbs. The length of male slightly exceeds that of female children, while the difference in weight is estimated by Dr. Clarke at about 9oz. avoirdupois. In the case of twins, the average weight of each twin is in general less than that of children born at single births, though the combined weight of both is greater. Dr. Clarke found that the average weight of 12 twins was 11lbs. avoirdupois each pair; the heaviest being 13lbs. and the lightest 8½lbs.

The *skin* in infancy is very vascular, sensitive and delicate, and usually of a deep-red colour; it is covered with an unctuous matter, called *vernix caseosa;* and a few days after birth the cuticle desquamates. The *limbs and prominent parts of the body* are well protected by fat and cellular tissue filled with serum; the *tendons* and *ligaments* are imperfect; and the *muscles* are soft and gelatinous.

As regards the *skeleton*, the *bones* are small, soft, being chiefly cartilaginous, and deficient in earthy matter; those of the skull and ribs are the most advanced in ossification. The *bones of the skull* are united to each other by a membrane, the sutures not having begun to form. The membranes cover six openings called *fontanelles*, which gradually close until at about the fifth year the bones are found united by suture. The *long or cylindrical bones* contain no distinct medullary cavity, but present in their interior a soft or loose bony texture; the epiphyses are separate from the shafts of the bones during the greater part of childhood, and have distinct centres of ossification. The period at which ossification is finished varies; the epiphyses are rarely firmly united with the osseous cylinder till between the 16th and 17th years. The *lower extremities* are less developed than the *upper;* the *pelvis* is small and looks contracted; the *thorax* small, flattened at its sides, but prominent in front; while the *head* and *abdomen* are disproportionately large compared with the rest of the body, and with the size which they attain in after life. There is generally some hair on the scalp.

The *digestive organs* are perfectly adapted for producing rapid changes in the food introduced into them, thus affording a continual supply of the materials for nourishment and growth. The mouth, though apparently imperfect from the absence of teeth, is fully and admirably formed for extracting the food prepared by the mother and conveying it to the pharynx. The stomach is small, long, and somewhat resembles the large intestine in form; its anterior or lesser curvature being but slightly arched, while the larger curvature is scarcely developed—an arrangement which shows that this viscus is not suited for receiving much food at a time, or for retaining it for any period. The intestines are also relatively smaller and shorter than in the adult, and their peristaltic action is more rapid; so that all excrementitious matters are quickly got rid of, the infant generally having an evacuation every five or six hours. The mucous membrane of the whole of the alimentary canal is thick, soft, villous, vascular, and freely bedewed with mucus; it is very sensitive, and readily irritated by improper food. The salivary glands, the pancreas, the lacteal vessels, and the mesenteric glands are largely developed. The kidneys are large and have at first a lobulated appearance; the supra-renal capsules are of considerable size, but they soon diminish; the spleen is small. The liver at birth occupies almost one-third of the abdominal cavity, but becomes smaller—especially the left lobe—when the circulation is changed by the obliteration of the umbilical vein and ductus venosus, and the development of the vena portæ. The intestines contain a peculiar dark-coloured substance, called meconium; it is an excretion from the alimentary canal, and it seems likely that its dark colour is due to the presence of some inspissated bile; but its exact nature and importance are not yet understood.

The *respiratory organs* undergo a more remarkable change directly the child is born than any other part of the body; the lungs, on being permeated by air, at once increase in size, they become light and vesicular in structure, and of a deep-red colour, in the place of being small, dense, and of a brownish colour, as they were in the fœtal state. Occasionally it happens—when, from any cause, the function of respiration is established with difficulty—that portions of the lungs remain solid and unaërated: these portions are then said to be in a condition of atelectasis. The respirations are quick but very feeble; during the first year they range from 35 to 40 in the minute, being nearly double those of an adult; but as growth proceeds, as the infant's weakness is lessened, and as the vital processes are rendered less active, they gradually become slower. In infancy, too, the consumption of oxygen is smaller, and the power of generating animal heat—a function which is closely connected with respiration—is less than at later periods. The thymus gland, so large in the fœtus that it occupies a considerable space in the upper and anterior part of the thorax, soon begins to diminish after birth, though it remains of considerable size during the first year; in the adult it can scarcely be recognized.

The *organs of circulation* present many remarkable peculiarities in the early stage of infancy. Compared with adult-life the volume of the heart is large; its parietes are softer and paler than in after-life, and of nearly equal thickness throughout; the left cavities are larger than the right, which is the reverse of what they ultimately become. The foramen ovale and ductus arteriosus usually become obliterated, or nearly so, before or about the tenth day after birth; after which the walls of the left ventricle quickly increase in thickness, and its cavity begins to diminish in size. The action of the heart is ordinarily quick, but it varies a good deal, not only from emotional causes, but even by position, and at different times of the day.

In examining the *nervous system* we find the brain large, soft, somewhat undeveloped in structure, and about 10 oz. in weight in the newly born, but so rapid is the growth, development, and the nutritive activity of the nervous system and of the brain in particular, that during the first two years it nearly doubles its weight: the brain of the adult ranges between 3½ and 4lbs. in weight. The convolutions are imperfectly marked, as we should expect they would be, if we believe—as most physiologists do—that intelligence is in direct proportion to their extent; while the cineritious or cortical portion scarcely differs in colour from the medullary. The meninges are more vascular than in the adult. The structure of the spinal cord and nerves is more perfect than that of the brain, these parts being devoted to the more primitive functions of sensation and voluntary motion. The chemistry of the brain in early life, though a vitally interesting subject, is yet not one which we can here describe fully—indeed, in the present state of the question, its consideration would not serve any useful purpose. There is, however, one point of especial interest to which we may allude—viz., the presence of phosphorus in brain tissue; this is remarkable, first, because the quantity in childhood is relatively very much less than in adult brains, secondly, because it is usually very deficient in the brains of idiots, and lastly, because in some of the slighter forms of the latter condition we have found the administration of phosphorus remarkably beneficial.

The *secretion of urine* is abundant in the unweaned infant; it becomes scanty when lactation has ceased. The urine is of rather low specific gravity, of a light colour, and rich in urates.

The *functions of the lachrymal glands* remain in abeyance until the third month, hence the cries of young infants are not accompanied with tears.

The *organs of the external senses* are all present at birth, and the nerves distributed to them are large. The *eye* seems fully developed, although for the first few days the child gives but little indication of visual sensation; the *ear* is imperfect, the new-born infant being apparently deaf; the *nose* is small, and the nasal fossæ are wanting: the *sense of touch* is very imperfect. The *larynx* is very small, but increases in size as the infant begins to articulate at from six to twelve months old: most children speak plainly when from two to three years of age. The *genital organs* are small, except the clitoris and nymphæ of the female, which often appear disproportionately large; the evolution of the generative apparatus marks the age of puberty.

CHAPTER III.

THE HYGIENIC MANAGEMENT OF INFANCY AND CHILDHOOD, AND THE CONDUCT OF WOMEN DURING PREGNANCY.

It may be well to say a few words upon the general *Conduct of Women during Pregnancy* before entering upon the subject of the hygienic management of children, as the subsequent health of their offspring very much depends upon the way in which mothers manage themselves at that period. Moreover, there are probably few medical practitioners who are not occasionally consulted as to the care which women ought to take of themselves during pregnancy, both with regard to their own and their infant's welfare; it is, consequently, most desirable that we should be able to give plain and sensible directions on the subject.

However highly a woman may have been educated, she unfortunately finds, only too frequently, when maternal duties are coming upon her, that her acquirements and accomplishments are but of small service in this respect; for although she may have gone through a long and expensive course of education, yet, in too many instances she has learnt little or nothing of the most important of her social duties. On consulting the friends and acquaintances of her own age, to whom she can speak unreservedly, she finds that they too know but little more than herself; and hence she seeks advice from some old nurse or other time-worn dame, who has, probably, certain absurd traditional precepts which she delights to promulgate as immutable laws. Thus mischief is often caused, not from any wilfulness on the part of mothers, but merely from ignorance or a careless disregard of a few common-sense rules.

Now the points upon which we may be consulted are diet, clothing, cleanliness, exercise, and moral discipline.

The Diet should be simple, light, nutritious, adapted to the requirements of the individual and the condition of the digestive organs. Highly-seasoned or rich food is bad, tea and coffee should be used only in moderation, and alcoholic stimulants are—to say the least—generally unnecessary. It is often erroneously thought that an unusual supply of nourishment is required during pregnancy to support the strength and aid the development of the fœtus; consequently, either an increased supply of food is taken, or a change is made from a plain and nourishing diet to full and generous living. Both of these errors are to be avoided: for they will surely either give rise to a state of plethora, which is as injurious to the mother as it is to the embryo; or they will produce in the former, debility, dyspepsia, nausea, heartburn, &c., and in the latter, constitutional feebleness: for the results must be the same to the infant, whether the insufficient nourishment arises from want of food or from inability of the mother's stomach to digest it. Where the digestive powers are good, and eating is not followed by oppression or languor, there can be no harm in satisfying the appetite with such food as the patient may be accustomed to, and which she knows from experience agrees with her. A too spare diet is, on the other hand, no less injurious and reprehensible. Unhappily, however, it is less easily avoided; and many of the wives of the labouring classes not only suffer much themselves from their inability to procure a due supply of wholesome food but, as a consequence, they too often give birth to feeble and unhealthy children, who ultimately perish from strumous or tuberculous disease.

The craving and capricious appetite from which pregnant women often suffer, most frequently requires only a little self-denial to be controlled, and is in no instance to be remedied by any excess in food or wine. So also with respect to *longings* for unusual or extraordinary kinds of food: these should seldom be gratified. Nothing, indeed, can be worse than pandering to these symptoms of a depraved digestion, and nothing is so likely to perpetuate them, to the risk of both mother and fœtus. A gentle laxative—rhubarb and magnesia, castor-oil, or a seidlitz powder—with a few hours' abstinence, will often remove them. Violent medicines, whether purgative or otherwise, are to be avoided during pregnancy; their exhibition being fraught with equal danger both to mother and child.

The Clothing should be warm and comfortable; tight bands, and the use of tightly-laced, stiff, unyielding corsets should especially be avoided. The breasts and body more particularly require to be secured from injurious compression, and the dress and under-garments should be so made that they may adapt themselves to the increasing size of these parts. The origin of the word *enceinte* may serve to remind us that the Roman ladies were wiser, in some matters at least, than many of our countrywomen in the present day: for on the occurrence of pregnancy, the tight girdle or cincture, which was at other times worn round the waist, was discontinued. Hence the pregnant woman was said to be *incincta*, or unbound. To attempt forcibly to compress the abdomen, while Nature is gradually enlarging it for the accommodation and development of the fœtus, is not only most absurd, but mischievous; for the circulation of the blood being impeded, a liability is induced to disorder of the stomach and liver, to hæmorrhoids, to uterine hæmorrhage, or even abortion. Delicate women, especially if they have long been accustomed to corsets, and if their abdominal muscles are relaxed, sometimes derive benefit and support from an elastic bandage or a broad flannel roller applied round the body; it must not however be tight. Where the circulation of the blood is languid, the lower extremities and feet will be cold, and will require to be protected by warm stockings and thick boots.

Cleanliness, so conducive to health at all times, is especially so during gestation. Few things will contribute more to the comfort of the pregnant woman than sponging and tepid bathing. A tepid bath repeated every morning, or every second morning, will soothe nervous excitement, prevent congestion of the viscera, and promote the healthy action of the skin; a flesh-brush or coarse towel should be used immediately afterwards.

Exercise in the fresh air is one of the simplest means of averting disease, and of contribuing to an easy recovery after delivery. Hence a walk—which is the best means of taking exercise—should be had daily during the whole period of pregnancy; taking heed, however, as the period of delivery approaches, that too much fatigue is not induced. If, in addition, a ride in an open carriage is desired, it may be useful. Riding on horseback, dancing, and other kinds of violent exertion, are to be avoided; as are also late hours, and remaining long in bed in the morning. Care must also be taken that the bedroom is large and well-ventilated, so that pure air may at all times be breathed.

Moral discipline is a matter of no less importance; for to ensure mental and bodily health for her offspring, it is not only necessary that the future mother should observe the external and physical laws of health, but she must also regulate her mental constitution, as well as her moral feelings and affections. Hence she should endeavour to be calm and cheerful, to subdue ill-regulated desires and wayward fancies, to keep her mind engaged by invigorating occupation and attention to her ordinary social duties, and to look forward to her labour with hope and confidence. If oppressed by a feeling of despondency, or disheartened by an impression that her labour will end fatally, the practitioner on being consulted will perhaps discover that this depression is due to some derangement of the bodily health which requires to be corrected. The pregnant woman should also especially avoid all strong mental emotion—such as immoderate grief, anger, or despair—since the vital functions are much influenced thereby, and abortion has many times been the result. For the same reason all exciting amusements, such as theatres, balls, &c., should be eschewed. The children of persons who enfeeble their health by late hours, by being in hot and crowded rooms, and by an irregular diet, are far more disposed to convulsive affections than the children of those who are regular in their mode of living, and who enjoy the calm tranquillity of a country life.

The following facts may be mentioned to show how strongly the mental condition of the mother during pregnancy affects the infant. In the chief cities of Europe, the mean proportion of still-born children is one in every twenty-two births; the number being three times greater among illegitimate than among legitimate children. Baron Larrey relates, that after the siege of Landau, in 1793, of 92 children born in the district soon after, 16 died at the moment of birth, 33 languished for from eight to ten months and then died, 8 became idiotic and died before they reached the age of five years. and 2 were born with several of their bones fractured; so that 59 children out of 92 appear to have died from the mother's anxiety and misery, and the results upon her organization. The philosopher Hobbes is well known to have ascribed his own excessive timidity and nervous sensibility to the fear in which his mother lived before he was born, owing to the threatened invasion by the Spanish Armada; and her anxiety increased to such a pitch on the news of its actual approach, that premature labour came on. In like manner the constitutional nervousness, the want of "firm resolve," and the extreme aversion to the sight of a drawn sword, always shown by James I. of England, was commonly attributed to the constant anxiety and apprehension suffered by Mary during the period of gestation; as well as to the brutal murder of Rizzio having been perpetrated in her presence during the same period. On the other hand, it is a well-known fact that almost all great men have had mothers remarkable for their mental endowments and activity; although too much importance must not be attributed to this circumstance, since, it may be said, such parents are precisely those who would pay the greatest attention to the education and early training of their offspring.

It may be mentioned in connection with the subject of the relation of bodily deformities in the offspring to maternal mental impressions, that Dr. William Hunter investigated this subject, at the Lying-in Hospital to which he was attached, and that in 2,000 cases there did not occur a single instance in which there was any coincidence between the fright, or accident, or longings of the mother, and the deformity of the child. There are certainly many curious cases recorded which we cannot venture to explain; the following case for instance. A patient inquired one day if the writer had ever seen an infant with two tongues; being answered in the negative, she undertook to show one, and accordingly a child was brought, when the following story was related: Three or four months before her labour she went into a builder's yard, and was much alarmed by seeing a large dog with its tongue hanging out of its mouth. Some days after her confinement she looked in her child's mouth, and saw that it had two tongues: she showed it to her medical man, and he confirmed her opinion. On examination however, it was found that the *sublingual gland* was remarkably developed, and that this had been mistaken for a second tongue!

But, though we are unable to explain many of the curious coincidences of this kind which are recorded, and though we cannot altogether accept the view which is held by some authorities on this question, it is nevertheless important to remember, that as disease may mutilate or death destroy the child, while still within its mother's womb, every precaution should be taken to maintain the parent's *body* in a state of health; and as the general condition of the mother's *mind* has an important influence upon the future mental and perhaps bodily health of her offspring, all those about her should contribute as much as possible to her comfort and cheerfulness. This is not to be done by foolish indulgence, but rather by forethought in a thousand little matters which individually may appear trivial, by good-natured equanimity, and by removing or smoothing all sources of care and anxiety. The nervous susceptibility during pregnancy is unusually acute, and hence a little tact and forbearance will be found necessary.

Having premised thus much on the conduct and management of pregnant women, we may now consider somewhat in detail *the general hygienic management and education of children*: and first, with regard to *the management of the infant at birth.*

No more striking picture of helplessness and weakness can possibly be imagined than that exhibited by an infant at birth. Incapable of making any regulated movements, it requires assistance of every kind; and if left to itself quickly perishes. To learn the nature of the assistance demanded, let us imagine that a new-born child has just been placed in our hands; that the accoucheur has tied and divided the umbilical cord about two or three inches from the navel, has removed the mucus from the lips and mouth to prevent any obstruction to respiration, and has satisfied himself that the child is apparently healthy and well formed. The first point which will be forced upon our attention is this, that the new state of existence is by no means an agreeable one; for the child, by its loud cries, testifies to this. Nor is this surprising, when we consider that an abrupt transition has been made from a state of unconscious repose, with a temperature of 98° Fah., to the rude contact of rough cloths and flannels, and the comparatively cold temperature of air only heated to about 70°. The sensitiveness of the infant's nervous system is, however, its safeguard; the stimulus of the atmospheric air applied to the extremities of the cutaneous nerves being probably the cause of the first inspiration; while the act of crying is in itself beneficial, since it contributes to the perfect filling of the pulmonary air-cells. The infant thus begins to breathe, and the blood commences its circulation through the lungs in order that it may be duly oxygenated. The explanation given above of the cause or origin of respiration—which is now very generally admitted by physiologists—was first offered, we believe, by Dr. F. H. Ramsbotham, who says—"Dissection teaches us that the cutaneous nerves communicate most freely with each other, and that a large extent of skin is supplied from the same source as the diaphragm, the chief power employed in respiration. The *phrenic,* or *internal respiratory nerve,* is derived from the second, third, and fourth cervical; and large branches from both the second and third supply the back part of the head, the jaw, neck, shoulders, arms, and the upper part of the back and chest. Thus, then, the diaphragm, and the integuments of the upper part of the body—parts remote in situation—*are connected together by the direct sympathy of nervous communication*; and it would be an inevitable consequence, that any stimulation applied to the extremities of one set of branches supplying the skin, would be propagated to the other extremities of the same nerve ramifying on the diaphragm. The consequence of that stimulation would be the contraction of that muscle; by that contraction its convexity towards the thorax would be destroyed; it would be drawn into the form of an inclined plane; the capacity of the chest would be increased; and the external air would rush through the trachea into the pulmonary cells to fill the void thus created."

The function of respiration being thus fully established, any further exposure to cold will not only be unnecessary, but injurious. Hence the infant should be enveloped in warm, soft flannel, and then placed in the lap of a nurse, seated near a good fire. "Instinct," says Dr. W. F. Edwards, "leads mothers to keep their infants warm; though philosophers, by more or less specious reasoning, have, at different times, and in different countries, induced them to abandon this guide, by persuading them that external cold would fortify the constitutions of their children, as it does those of adults."

The experiments of the same physiologist also teach us that the heat of the mature infant at birth varies from 93° to 95° Fah., being about 5° less than that of the adult; while the heat of infants born prematurely is still less. Supposing that the infant appears healthy and active, it may be forthwith washed, the white, unctuous, tenacious substance denominated the *vernix caseosa*, being gently removed with a fine sponge. If any difficulty is experienced in removing this material, it should be allowed to remain rather than any force should be used: for it will readily scale off in a day or two, or come away in subsequent washings. If soap be used, glycerine or Castille soap will be the least injurious. The washing being finished, the body is to be dried with a warm, soft napkin: and a little violet powder—powdered starch scented—may then be lightly dusted over the surface, especially about the axillæ, groins, knees, &c. The cut extremity of the cord is to be examined, to ascertain that there is no secondary hæmorrhage calling for the application of a second ligature; and the cord is then to be enveloped in a small piece of rag, and laid flat upon the abdomen, in which position it is to be retained by a thin flannel roller, about four inches wide, gently applied once or twice round the body. The infant is then to be dressed in long shirts, petticoats, bed-gowns, &c., made of light, soft, warm materials, and fastened by strings instead of pins, a muslin or flannel cap put on its head, and finally wrapped in a loose flannel shawl, and carried to its mother. With regard to premature or very weakly children, it may be better that they should not be dressed for a few hours: and in that case they should be kept in a cradle near the fire, the body and limbs being thoroughly enveloped in cotton wool.

It was formerly the practice, as soon as the infant was dressed, to administer to it a dose of some mild purgative, such as manna, castor-oil, butter and honey, &c.;—the speedy expulsion of the meconium having been deemed a matter of importance. This practice, however, ought never to be encouraged; since it is not only unnecessary, but injurious, for the mechanical distension produced by the infant's first food will generally cause the bowels to act, even if the colostrum—the milk first secreted by the mother—be not itself endowed with purgative properties. Moreover, it is the first step towards that pernicious system of domestic drugging which cannot be too highly reprobated, and which no medical man should in any way sanction.

In considering the *Food of infants*, we may remark, that the chief alimentary principles by which all the higher animals are nourished may be divided chemically into four great groups,—viz., the *aqueous*, the *saccharine*, the *albuminous*, and the *oleaginous*. These principles, without any alteration in their essential composition, are capable of assuming an infinite variety of forms, of combining with each other, and of being transformed into new principles.

From the essential identity of the alimentary matters by which animals are nourished, and the composition of their own bodies, it follows that in order to keep the body in health the diet must be so arranged as to contain all the four staminal principles. Now the only material which fulfils these conditions is milk; which is a model of what an alimentary substance should be. "Every sort of milk that is known," says Dr. Prout, "is a mixture of the four staminal principles we have described; in other words, milk always contains, besides *water*, a *saccharine* principle; a *caseous*, or, strictly speaking, an *albuminous* principle; and an *oily* principle. Though in the milk of different animals the latter of these three staminal principles exist in many modified forms, and in very different proportions, yet neither of them is at present known to be entirely wanting in the milk of any animal."

From eighty-nine analyses of the milk of women which have been made by MM. Vernois and Becquerel, the following results have been obtained:—

	Maximum.	Minimum.	Mean.
Specific gravity	1046·18	1025·16	1032·67
Water	999·98	832·30	889·08
Solid constituents	147·70	83·33	110·92
Sugar of milk.	59·55	35·22	43·64
Casein and extractive matters	70·92	19·32	39·24
Butter	56·42	6·66	26·66
Incombustible salts	3·38	0·55	1·38

Thus it appears that this secretion is liable to great varieties, dependent upon a number of different circumstances, and that no analysis can be quoted which will apply to all cases. The foregoing analyses, however, are sufficient to give very good general notions on the subject.

Contrary to what we might have anticipated, these authorities found, and our experience fully corroborates this, that thin, spare, but otherwise healthy women, produce far richer and better milk than the more robust and apparently more vigorous women.

There can be no doubt that milk, and milk alone, is the proper aliment for infants during the first few months after birth, until the first few teeth are cut; and that in all cases, where it is possible, this nourishment should be afforded by the mother herself, who should be very jealous of transferring her privilege to a stranger. As regards the time after delivery at which the child should be first presented to the breast, authorities differ; some thinking that ten or twelve hours should elapse, that the mother may the better recover from her fatigue; others, that no time should be lost after the infant is dressed, and the mother made comfortable. The latter plan we believe to be the best; for, without considering whether such a proceeding is advantageous to the infant, there is no doubt that it is of great benefit to the mother; inasmuch as the early sucking of the child not only gives a proper form to the nipple and facilitates the flow of milk, but the irritation of the mammæ tends, by reflex action, to contract the uterus, and thus materially to diminish the risk of secondary hæmorrhage.

Unfortunately, however, it is not every mother who is capable of suckling her infant; and the question arises—How are we to tell when such is the case? The chief conditions which disqualify a mother for the office of nurse are:—An extremely sensitive and excitable temperament; severe constitutional deterioration from any cause; a strong predisposition, either hereditary or acquired, to scrofula, tubercle, cancer, syphilis, epilepsy, or insanity; and the existence of any severe disease, as puerperal mania, puerperal fever, &c. In addition to these circumstances, the mother may be prevented from fulfilling her duties owing to the secretion of milk being so scanty as to be almost useless; or the secretion may be abundant, but it may be poor and watery, and deficient in milk globules; or, lastly, the nipples may be so flattened and buried in the mammæ that they cannot be drawn out by the infant.

Supposing then, from any of these causes, that the mother is rendered incapable of performing the duty which naturally devolves upon her, the infant must either be reared by a wet-nurse, or be "brought up by hand." The principal requisites for a good wet-nurse are—that she be between twenty and thirty years of age; of active and temperate habits; of a robust and healthy constitution; of quiet, patient, cheerful disposition; exempt from any tubercular, scrofulous, or syphilitic taint; with a complexion fresh and clear; her skin free from eruptions; her gums red and firm; her teeth sound; the tongue clean, and the breath sweet; the breasts should be oblong, firm, and vascular, with well-developed nipples; the milk abundant on pressure of the breast, thin, and of a bluish-white colour, sweet, throwing up plenty of cream when allowed to stand, and, on being thrown into water, assuming a light cloudy appearance, and not falling to the bottom in thick drops. "Nurses who have not a good supply of milk will occasionally be found to adopt a practice commonly employed with milch cows when brought to market, and called by the cattle dealers *stocking;* that is, they allow the milk to accumulate in their breasts for several hours before presenting themselves for examination, so as to cause the examiner to believe that they are very abundantly provided. Young practitioners should be especially on their guard against this deception." Lastly, it will be well if the date of her labour does not differ materially from that of the parent whose place she is to fill, for it is found that the milk becomes richer, especially in casein, as time goes on. It is thought by many that the milk of fair women is inferior in quality to that of dark. L'Heritier selected two females—one a blonde, the other a brunette—each twenty-two years of age, and got them to adopt the same diet and mode of life. The most marked of his various analyses is shown in the following table:—

MILK OF WOMEN OF DIFFERENT TEMPERAMENTS.

Constituents.	The Blonde.	The Brunette.
Water	892·00	853·30
Butter	35·50	54·80
Casein	10·00	16·20
Sugar of milk	58·50	71·20
Salt	4·00	4·50
	1000·00	1000·00

In order to keep the wet-nurse in good health, she must live regularly on simple, nourishing, and digestible food, very much of the kind she has been accustomed to; she must avoid overloading the stomach, and so inducing dyspepsia; she may drink beer or wine in moderation, when she has previously been in the habit of doing so, good stout or claret appears to be the best for making milk—the latter we have often noticed will cause a speedy flow of milk. She must be scrupulously attentive to cleanliness; and she should daily take moderate exercise in the open air. If the catamenia appear while she is nursing, or if conception takes place, the infant will certainly not thrive as it ought, owing partly to the diminution of the lacteal secretion. Cazeaux remarked long since that there is probably "some relation of causality between the rachitis of children and the frequent occurrence of menses during the greater part of lactation;" and Dr. Tilbury Fox states as the result of his observations, "that wherever the rachitic child is *entirely* dependent upon the mother's milk, the mother will be found to have menstruated during lactation regularly for several months, and the degree of rachitis to be in direct ratio to the frequency, duration, and amount of the menstrual flow." The alleged fact he attributes to menstruation causing a deficiency in the phosphatic elements of the lacteal secretion. When the nurse suckles a child of her own along with the nursling, constant care should be taken to ascertain that the supply of milk is sufficient for the wants of both. Suckling from a suppurating breast is bad both for infant and nurse, and ought not to be allowed. The only sure test of the goodness of the nurse is the condition of the child; if the latter, consequently, does not thrive, but becomes thin and puny, feverish and thirsty, sick, constipated, irritable, and restless, the nurse should be at once changed. On the other hand, a child may take an abundance of food and yet be badly nourished, for the reason that what it takes it does not digest, a craving is created which nothing satisfies, and the child dwindles and falls away even in the midst of plenty.

Very sickly children sometimes have not the strength to suck properly, and all children require to be carefully held to the breast so that the nipple falls easily into the mouth. Sometimes when the flow is very free it is necessary to restrain it by gently nipping the teat.

In cases where the mother is unable to nourish the infant, and a wet-nurse cannot be procured, our only resource is to rear the child by careful artificial feeding. During the first few months, at all events, all farinaceous food should be carefully avoided, for the child's stomach is not at present equal to its digestion. Little or no saliva is formed till at least the third month, and the absence of this makes starchy food almost undigestible. Moreover, by appropriating, as starches and sugars do, the oxygen which otherwise would be used in combining with the waste materials to effect their removal, they directly retard the depuration of the blood, and hence another reason for withholding them. This rule should be observed for at least six months, after which a little arrowroot, or baked flour, may be added to the milk. The food usually resorted to at first is the milk of the cow, as it is less expensive and more readily procured than the milk of any other animal. It differs from human milk in containing less of the oleaginous and saccharine principles, but more of the albuminous; hence it should be slightly sweetened, and diluted with one-third part of plain water, or of barley or lime-water, and to this a little cream may be added (about two drachms to the half pint), as recommended by Sir W. Jenner. There is no need for any dilution after the fourth or fifth month. When expense is no objcet, or when the infant's health absolutely demands it, we must resort to some food which bears a stronger resemblance to human milk; and fortunately, in asses' milk we have what is required. The subjoined table shows the chief differences between the milk of various domestic animals and that of woman:—

Composition of the Milk in Woman and in various Animals.

	Specific Gravity.	1,000 Parts contain		The Solid Components consist of			
		Fluid.	Solids.	Sugar.	Butter.	Casein and Extractive Matters.	Salts.
Woman	1032·67	889·08	110·92	43·64	26·66	39·24	1·38
Cow .	1033·38	864·06	135·94	38·03	36·12	55·15	6·64
Ass .	1034·57	890·12	109·88	50·46	18·53	35·65	5·24
Goat .	1033·53	844·90	155·10	36·91	56·87	55·14	6·18
Ewe .	1040·98	832·32	167·68	39·43	54·31	69·78	7·16

Occasionally, asses' milk gives rise to diarrhœa: this is easily checked by mixing with it one-fourth part of lime-water, as it prevents the coagulation into lumps which are often so indigestible, and occasion a good deal of trouble and discomfort. Whether we choose the milk of the cow, or of the ass, or of the goat, which often agrees well, it should be warmed to about 96° Fah., and administered by means of a feeding bottle, having a nipple formed of vulcanized india-rubber, or chamois leather, or of a calf's teat, or of cork; for the exertion of sucking aids the development of the muscles of the mouth, and, by promoting the secretion of saliva, helps digestion.

The best form of bottle is that sold by most druggists under the name of the *British Feeding Bottle.* Amongst its advantages are the following:—It can be placed in any position without the food running out; while the infant is sucking, the supply of food can be regulated or stopped without taking the teat from the mouth; there is no possibility of the infant drawing in air with its food; and the whole is simple in structure, and easily kept clean.

Whether the infant be reared by the mother, or by a wet-nurse, or by artificial feeding, it should be kept as near as possible to the food first chosen, until after the seventh or eighth month, when the teeth begin to appear. It should also be regularly nursed or fed during the first five or six weeks of life about every two hours through the day, and every three or four hours during the night; the intervals being gradually increased until they reach three or four hours in the day, and six or eight at night. Thus the nurse will be refreshed, and her patience and moral strength recruited, by some hours of uninterrupted sleep; which is with difficulty obtained by those who have once got into the habit of offering the child the breast whenever it cries or shows any appearance of uneasiness. The child should also be fed from each breast alternately.

As regards the quantity of milk which the infant requires each time it is nursed, it can only be roughly stated that it varies from one ounce and a half to five or six ounces: less than the former being insufficient for the purposes of nutrition, while more than the latter will probably induce vomiting.

Much greater care and watchfulness is needed in the case of a child which is being fed by any other than human milk, for the milk of the goat, ass, or cow, especially the latter, is much heavier, and contains a good deal more casein, butter, and salts; rennet causes it to coagulate in large, compact masses, and these being difficult of digestion will often occasion flatulence and consequent colic and diarrhœa. Hence the child becomes restless and irritable, evidently from pain and hunger; the nurse then, under a mistaken notion, feeds the child again, thus only aggravating the evil; diarrhœa goes on, with emaciation, and when the stools are examined we shall find that a good deal of undigested and coagulated milk has passed away in them—the remedy here is not to increase the amount of food given, but to diminish it, and to see that it is made lighter, more digestible, and more nearly resembling what would be given to the child if fed in the natural way. Van Wyck recommends diluted and sweetened fresh cream instead of diluted cow's milk, because he considers it to be a nearer approximation to women's milk, and less liable to adulteration. He sweetens this food with milk-sugar in preference to cane or beet sugar, for the reason that, should acidification of the food occur, the former produces lactic acids whilst in the other acetic acid is the result. To a child a week old, in good health, he gives, cream, 1 part; boiling water, 11 parts; milk-sugar, 25 parts. He prefers bicarbonate of potash as an antacid, giving a quarter of a grain to each fluid ounce of food; and if curd is found in the excreta, he doubles the quantity. He also recommends whey sweetened with sugar of milk. Jacobi advises a teaspoonful of powdered barley to be boiled in from three to six ounces of water, with a pinch of salt, for twelve to fifteen minutes, and then strained through a linen cloth. This is to be mixed with half as much boiled milk, and sweetened with a lump of white sugar. It is to be given lukewarm. Should the casein of the milk coagulate, he substitutes oatmeal for the barley, and treats any constipation with bicarbonate of soda added to the evening meal.

Among artificial foods, when such are found to be necessary, Liebig's "Food for Infants," and Nestle's "Food for Infants," which, besides milk, contain a little malt, wheat flour, and a small quantity of bicarbonate of potash, are found to answer very well.

The proper time for *weaning* healthy children is between the ninth and twelfth months, when Nature—by providing teeth, and increasing the development and muscularity of the stomach—indicates that a more solid diet is required. The change, however, is not to be made abruptly: and hence, when the first teeth begin to appear, at the end of the seventh or eighth month, a little supplementary food may be very gradually allowed—such as pure, undiluted cow's milk, thin arrowroot, well-boiled gruel, veal or mutton broth, or beef tea—while, at the same time, the quantity of nourishment derived from the mother is slowly diminished. The infant will thus daily become reconciled to the almost imperceptible alteration in its diet; while the mother's lacteal secretion will by degrees diminish as the demand for it lessens, until it ceases entirely by the time the child is one year old or a little later.

Although there is but little risk of mothers in the upper classes of society unduly prolonging the period of lactation, this is by no means the case with the lower orders; who often continue suckling for two years or more, in order—as they think—to avoid pregnancy. That this result is not always obtained we now well know; for, though there is doubtless some functional antagonism between the mammæ and ovaria, yet the influence of the latter would seem after a time to preponderate, for, as Mr. Roberton's researches prove, more than fifty per cent. of the women of the lower classes in Manchester become pregnant during the performance of lactation. There are, of course, some cases of delicate children where weaning may well be delayed for two, three, or four months after the proper time, provided the mother's health continues good; but if the latter begins to fail, or the supply of milk diminishes, nursing should be abandoned.

For some time after weaning, the principal nourishment should consist of semi-fluid substances, for it must be remembered that the digestive organs are still weak, and that the stomach is easily oppressed and disordered. Of the various kinds of food in daily use, the best are—arrowroot, made with milk and water; thin gruel, made from groats or prepared barley, strained and sweetened; plain biscuits, or "tops and bottoms," soaked in boiling water, strained through a sieve, and then mixed with sweetened milk; milk and isinglass; or sago, thoroughly boiled in weak beef-tea, with the addition of a little milk. The late Dr. Churchill recommended a "bread jelly," which he ordered to be prepared thus:—A quantity of the soft part of a loaf is broken up, covered with boiling water, and allowed to soak for some time; the water—containing all the noxious matters used in making the bread—is then strained off completely and fresh water added, and the whole placed on the fire and allowed to boil slowly for some time, until it becomes smooth; the water is then pressed out, and the bread on cooling forms a thick jelly, a portion of which is to be mixed with milk, or water and sugar, for use as it is wanted. Dr. Gumprecht, of Hamburg, in the year 1849, drew the attention of the profession to a novel kind of food, which will often be found useful—viz., carrot-pap; it is to be made thus. An ounce of finely-scraped full grown carrot is to be mixed with two cupfuls of cold soft water, and allowed to stand for twelve hours. The fluid portion is then to be strained off; that which remains being pressed, to yield as much as possible. This fluid is then to be mixed with the proper quantity of biscuit-powder, or bruised crust of bread, or arrowroot, and the pap placed over a slow fire until it begins to bubble; care being taken that the heating be not pushed so far as to cause boiling, or the albumen will coagulate. After its removal from the fire, it is to be sweetened; and thus is formed a most nourishing agreeable pap, the use of which is only contra-indicated by any tendency to diarrhœa. Dr. Gumprecht states that, by mixing the carrot juice with biscuit, crust of bread, or arrowroot, and sugar, we obtain all the nutritious elements required—viz., albumen, gluten, starch, sugar, fat, and the phosphates of lime and magnesia.

As the child grows older and cuts all his first teeth, the diet must be further extended; and bread and milk, oatmeal and milk made into porridge, nourishing broths, light puddings, eggs lightly boiled, well-cooked vegetables, white fish, and fresh animal food—especially chicken or mutton—may be judiciously allowed. Fresh ripe fruit, in moderation, should be given; plain light pastry, simple cakes, and biscuits seldom do any harm; while the child's notorious love of sugar may be judiciously indulged, unless flatulence or acidity arise. Until, however, our confectioners cease to colour their bonbons with poisons, parents must be advised to have their sweets made at home. As a general rule, too, tea and coffee, wine and beer, should be interdicted; milk, or sweetened milk and water, and pure spring water, or toast and water, being much more wholesome.

As regards *Cleanliness*, this is of the utmost importance to health at every period of life, but especially so during infancy and childhood; for if the manifold and important functions of the skin be then imperfectly performed, general constitutional disturbance quickly ensues. Hence every care must be taken by frequent and thorough ablutions, gentle frictions, and clean soft clothing to maintain the healthy action of the cutaneous surface. On the importance of proper attention being given to the healthiness of the skin, we may with advantage quote the words of Hufeland, who, in his *Art of Prolonging Life*, says, "Let me here be permitted to call the attention of my readers to an incongruity, which is not the only one of the kind in human life. The most ignorant person is convinced that proper care of the skin is indispensably necessary for the existence and well-being of horses and various animals. The groom often denies himself sleep, and other gratifications, that he may curry and dress his horses sufficiently. If they become meagre and weak, the first reflection is, whether there may not have been some neglect or want of care in regard to combing them. Such a simple idea, however, never occurs to him in respect to his child. If it grow feeble and sickly; if it pine away and is afflicted with disease, the consequence of dirt, he thinks rather of witchcraft and other absurdities than of the real cause—neglecting to keep the skin pure and clean. Since we show so much prudence and intelligence in regard to animals, why not in regard to men?"

The safest and most convenient way of washing the infant is to immerse its body in a large tub or basin of warm water, while the head is supported by the hand and arm of the nurse; at the same time the whole surface of the body—especially about the scalp, joints, and folds of the skin—is to be well rubbed with a soft sponge, with or without the glycerine or Castille soap, so as to remove all offensive matters. After having been in the water for a few minutes, the child is to be taken out, quickly and thoroughly dried, and to have well-aired clothing at once put on. This bath must be used daily, the best time for it being in the morning as soon as the infant is taken out of its cradle to be dressed for the day. The water should be at first comfortably warm—*i.e.*, 90° to 96° Fah.; but if the season of the year will permit, it will in some cases be found advantageous to gradually diminish the temperature until it is reduced to 85° or 80°. The practice of using cold water for young infants is quite indefensible, as it is well known to have given rise to serious ill effects. As a general rule two baths should be employed in a day, the water of the morning bath being tepid, and that of the evening warm. In cases where there is great irritability, restlessness, and sleeplessness, this plan may be pursued with manifest advantage.

During the first few days of life care must be taken not to disturb the remains of the umbilical cord during washing. Generally this falls off between the fifth and seventh days, leaving a small granulation at the naval, which quickly heals.

Another important element of cleanliness during infancy is the speedy removal of all the damp and soiled clothing which results from the frequent involuntary discharges from the bladder and bowels. At the same time, also, the nates and groins are to be well washed with tepid water, gently dried, and lightly dusted with violet-powder or finely-powdered starch, or prepared calamine or oxide of zinc. The application of any powder is by some objected to; but it appears to us desirable rather to encourage its use, since it prevents excoriation, and is very soothing to the delicate and sensitive skin of infants.

The *Clothing* of infants and children—let physicians say what they may—will always be modified by fashion and the various caprices of parents: and so long as it is loose, simple, scrupulously clean, warm, soft, capable of being fastened without the use of pins, and not too heavy, we need not be particular as to its shape. The long flowing clothes in which infants are generally dressed for the first five or six months seem at first sight rather absurd; but without doing any harm, they certainly protect the legs and feet and lower parts of the body from cold air and draughts.

With regard to the material, some allowance must be made for the season of the year; but as a rule, cotton under-clothing is preferable to linen in this variable climate, since it is a better radiator and worse conductor of heat, and does not absorb moisture to the same amount. Its only disadvantage is that it is apt to cause irritation. For delicate children it is necessary to order thin flannel to be worn next the skin during the day, but not at night; while in a few instances good results follow the use of an under-waistcoat, and drawers, of chamois leather. In all cases the night-clothes should be looser and less warm than those of the day; and every article should be changed before putting the infant to rest in the evening.

A cap is seldom required, especially in the nursery; but if one is worn, it should be thin and light. The maxim which says, "Keep the head cool and the feet warm," should be borne in mind.

As children grow older, it is often thought desirable to strengthen or harden them by exposure to cold, and by wearing very short thin clothes, with light drawers, bare necks and arms, &c. This is a great mistake, as all must acknowledge who remember that the power of resisting cold in early life is very feeble. Whatever may be thought of the theory which regards heat as a mode of motion, there is very much which seems to suggest it as a mode of *Life;* certain it is that heat is essential to its maintenance, and warmth is no less necessary for the preservation of health. Of all predisposing causes of disease, there is probably none more powerful than cold. Hence, we should always insist that the dress be warm; large enough to clothe the whole person, including the chest, neck, and arms; and sufficiently loose to allow of perfect freedom of motion. There are some robust children whose constitutional powers will enable them to bear up against the hardening system with all its cruelty; but such are not to be brought forward in favour of its beneficial effects. They merely prove that their strength was sufficient to enable them to bear that which all medical men know has proved fatal to very many; and that they have grown up healthy in spite of the treatment, not in consequence of it.

In considering the subject of *Exercise and Sleep*, we should bear in mind that few infants acquire sufficient strength to support the back in an upright position before the end of the fourth month; so that until then, and generally for some months after, they should be carried out in a reclining posture on the nurse's arm, in such a way as to afford entire support to the body and head. During this period their bones and limbs are very delicate, so that they must not be shaken about roughly, nor tossed in the air, nor rocked too violently. As they grow older they begin to make efforts to raise themselves; and seem to experience satisfaction from being occasionally placed in a sitting position, or from being laid on the bed or on the ground, and allowed to roll and kick about at their pleasure. These movements not only afford amusement, but they act very beneficially by calling the numerous muscles of the body into action, and so increasing their strength and bulk; this will be at once apparent if an infant that has been allowed this freedom be compared with one who has been doomed to preternatural inaction by being swathed in stiff clothing. Towards the end of the ninth or tenth month, most infants may be taught to crawl about on their hands and feet; and a little later, unless very feeble, attempts may be made to teach them to walk by supporting them under the arms, guarding them against falls, and encouraging them to move from one chair to another. Great care is however necessary in this respect, for when from defective nutrition the process of ossification has been retarded, any forced attempts to maintain the erect posture, and to support the body on the legs, will only end in curvature of the long bones, and possibly also in spinal irregularity. Such children as present a favourable condition of development can, as a general rule, walk freely before the end of the fifteenth month; while of those who are badly developed, the majority will only begin to walk after this date. And it is far better to wait the natural efforts, be they early or late, rather than force them on a system unprepared.

We need not wait, however, for infants to be able to walk before exposing them to the wholesome and invigorating influence of the open air; for, after the first three or four weeks, their health will be much improved by their being carried out daily for one or two hours when the weather is favourable. M. Lévy well remarks that the want of fresh air is as detrimental to the nurse as to the infant; and that the mother, consequently, should insist on sending out both nurse and infant as much as the weather and season will permit, and be on her guard against encouraging that indolence which nurses are so apt to indulge in. The same author, when inculcating the advantages arising from exposure to the free air and light of open day, illustrates their influence by observing that the number of Cretins in the Valais is diminishing since the women have adopted the practice of removing from the humid and sunless air of the valleys, and residing during pregnancy on the more exposed and cheerful heights.

When the child has fully acquired the power of walking alone, he should be allowed the most perfect freedom of exercise, especially in the open air and during the middle of the day. We need hardly say that in the winter and spring months precautions will be necessary to avoid catarrhal affections; but if undue exposure to bad weather be guarded against, if the nurse walk quickly instead of loitering about with her acquaintances, and if the children are suitably clad in warm, well-made clothing, there will be but little risk. At a later period, active games in the field or garden, by exercising the limbs and exposing the body to the invigorating influence of the solar light, promote the growth and regular development of the whole frame; and parents cannot be better advised than by urging them to provide opportunity for such amusements, by allowing the free use of a garden, and furnishing proper toys—as balls, hoops, kites, &c.

With respect to the quantity of exercise to be allowed—no general rule can be laid down, other than that the dictates of Nature should be followed, and that, when fatigue is experienced, rest should be allowed. Young infants require a great deal of repose—the first few weeks after birth being passed almost entirely in sleep, with the exception of the time occupied in satisfying the instinctive calls for food. As they gradually grow older, however, and as the strength increases, the periods of wakefulness grow longer; although it must always be remembered that throughout the whole period of childhood more sleep is required than in adult age. To permit of this, children should be put to bed early in the evening, so that they may enjoy sleep for ten or twelve hours; and until they are three years old they must be allowed to recruit their strength by resting for an hour or two in the middle of the day before dinner. In awaking a child, care should be taken to do so gradually and gently, otherwise much injurious excitement may be produced.

A young infant requires a warm soft couch, with sufficient covering to protect it from the least impression of cold. During the first few weeks it may be advantageous for it to sleep in the same bed with its mother, especially if the weather be cold: but after this time a cradle or cot should be used. Nothing is more distressing to an anxious mother, or more annoying to an impatient nurse, than sleeplessness in her infant charge; and we must constantly be on the alert to prevent the baneful habit of resorting to laudanum, soothing syrups, and quack cordials, to force sleep. In the majority of cases we may be certain that when a healthy infant does not sleep, either its clothing is uncomfortable, or it is cold, or there is pain from some removable cause, or it has been over-fed, or fed on some improper food. If the removal of the cause does not suffice to induce sleep, a warm bath of a few minutes' duration will never fail to sooth, and will generally act as an excellent narcotic.

Most authors inculcate the importance of promptly training the child to habits of early rising; and provided these habits are enforced, not by curtailing the due proportion of sleep, but by making the child retire early to bed, and by teaching it to rise in the morning directly it awakes naturally, no objection can be offered. A story is current of Lord Mansfield, who himself lived to eighty-nine, that whenever very aged witnesses appeared in the court over which he so long presided, it was his wont to interrogate them as to their habits of life; and with the result that in no one habit was there any general concurrence except in that of *early rising*. Anecdotes of this kind, however, are for the most part either untrue or exaggerated. Early rising is doubtless in many ways favourable to health, but it cannot be taken as a guarantee for longevity. Even if the story above given were perfectly correct, it is more probable that the vigorous vitality in these instances maintained the habit, than that the habit maintained the vitality.

In regard to the *Nursery*, as the early years of childhood are mostly passed there, a few words on the management and arrangement of this apartment cannot be out of place in a work like the present, inasmuch as upon these matters depend in no slight degree the present and future health of the child. The first and most essential requisite in a nursery is that its situation should be such that it may always command a due supply of dry and pure air; while if, in addition, a room with a southern aspect and a cheerful prospect can be obtained, so much the better. Remembering the important agency of light, we should take care that the windows are large enough to admit it freely, and that no hangings or curtains are permitted to exclude it. The room should also allow of its being easily kept warm, and at the same time of being thoroughly ventilated without exposing the inmates to draughts of cold air. A temperature of 66° will be found comfortable. A large room is preferable to a small one. According to Dr. W. F. Edwards' view, the advantages of large apartments are not merely to be referred to the greater purity of the air, but also to the slight agitation of the atmosphere, caused by the space being extended, producing a feeling of well-being, similar to the sensation experienced on breathing in the country. As a general rule these advantages can be more readily obtained on the upper stories of a house than on the ground-floor, for in towns especially the atmosphere improves the higher we ascend. Every one knows that the impure exhalations from drains and damp unhealthy soils, as well as the poison from malarious districts, lie low, or, as Sir Thomas Watson says, "love the ground;" this is readily proved by the circumstance that travellers through fenny regions pass the night with comparative impunity in the upper rooms of an inn, whereas they would certainly suffer afterwards from intermittent fever if they slept on the ground floor.

When the size of the house will admit of it, the day-nursery should be separate from the sleeping-room. In every case, however, care must be taken that the latter is not over-crowded, either by furniture, or by allowing too many nursery-maids and children to sleep in it. At least five hundred cubic feet of air, or a space equal to eight feet square, must be allowed for every child, if the laws of health are to be observed, and if all the evils which result from breathing a vitiated atmosphere are to be avoided.

With respect to the management of the nursery, we need only observe that habits of order and cleanliness, as well as of regularity in regard to the meals, exercise, periods of rest during the day, and retirement for the night, should be attended to from the first. A really conscientious, kind, cheerful, and forbearing nurse, who is also clean and neat in her habits and person, is an invaluable acquisition, that should be duly encouraged and taken care of. Lastly, every loving mother who wishes to instil good thoughts into the minds of her children, and to have them grow up as valuable members of society, will take care to spend daily a certain portion of her time in their company.

CHAPTER IV.

MORAL AND INTELLECTUAL TRAINING.

THE most important points with regard to the physical education of young children having been discussed, it remains for us to offer a few observations on their moral and intellectual training. And here we must premise that this section has not been introduced without due consideration; for though at first sight it may appear that the practitioner of medicine has but little to do with the mental education of the young, further reflection will, we think, prove that this is incorrect, if, as we maintain, every medical man should be the *friend* of his patients. This observation must not be misunderstood. By a friend, we do not mean the boon-companion of an hour, or an associate to grace a dinner-table: but rather the *alter ego;* one who can be consulted on many momentous questions; one who will be sought after when the heart is full of sorrow, and when acquaintances turn away. By a friend, we understand one who, on being asked for advice, will give his heartiest counsel; will endeavour to realize the position of him who seeks his aid; and assist and act in every way as he would wish to be done by. A friend should be generous, faithful, and honest; frank and open; and while true to his own conscientious opinions, he should yet be free from that illiberal or excessive self-love, which gives birth to pride, prejudice, and jealousy. In a word he should—in the true acceptation of the term —be a *gentleman;* in that sense which allows that though no amount of wealth can purchase this title, it is yet within the reach of the humblest artisan.

Supposing then that in the medical practitioner such a friend—or as near an approach to such a one as our imperfect nature will allow—is to be found, is it not most probable that he will be asked for an opinion as to the future intellectual training of the child whose ailments he has watched from birth, and as to whose welfare he feels a real interest. What is the constant theme upon which a young mother loves to dwell? Is it not her infant? What subject can be of greater moment to a father than the future prosperity and happiness of his child? The old Greeks gave expression to a true sentiment when they said, "that what made men citizens, patriots, heroes, was the love of wedded wife and child."

The grand rule for parents to adopt in educating their offspring, is to direct the training in harmony with the laws of Nature; or in other words, with a due regard to the principles of physiology, so that the child may grow up with a sound mind in a healthy and vigorous body. To do this, the training must be commenced at a very early period; every step must be made slowly and deliberately; valuable lessons are to be given without any appearance of teaching; and as the child's faculties are developed, so is its mental nourishment to be gradually made stronger and more suitable to the improvement manifested. The infant at birth possesses very little power of perception, many of its senses are imperfect, and its system is only, as it were, a rich soil waiting for cultivation. The ever-watchful parent will soon perceive manifestations of intelligence: "even at the early age of six weeks, when the infant is still a stranger to the world, and perceives external objects so indistinctly as to make no effort either to obtain or avoid them; he is, nevertheless, accessible to the influence of human expression. Although no material object possesses any attraction for him, sympathy, or the action of a feeling in his mind corresponding to the action of the same feeling in the mind of another, is already at work. A smiling air, a caressing accent, raises a smile on his lips: pleasing emotions already animate this little being, and we who recognize their expression are delighted in our turn. Who, then, has told this infant that a certain expression of the features indicates tenderness for him? How could he, to whom his own physiognomy is unknown, imitate that of another, unless a corresponding feeling in his own mind impressed the same character on his features? That person near his cradle is, perhaps, not his nurse: perhaps she has only disturbed him, or subjected him to some unpleasant operation. No matter, she has smiled affectionately on him; he *feels* that he is loved, and he loves in return." The mere soothing and gentle fondling of a mother, then, is no unimportant lesson, since it is the first step towards the proper cultivation of the affections; and hence, at this time, must be laid the foundation of that love which may, perhaps, do more to guide the future responsible being aright than many may imagine. As the perceptive faculties come fully into play, the fostering care of the parents, and the quiet influence of home do their good work; until—as months pass on—the reasoning powers begin to be gradually developed. At this time the naturally cheerful and joyous dispositions of children are to be encouraged; kindness and gentleness are to be taught by example; good habits and noble feelings are to be cherished; generosity and self-denial gently inculcated; and, above all, prompt implicit obedience insisted upon. All this cannot be done, however, without forethought nor without those in charge of the little one learning to accommodate themselves to its powers, and in some degree, to its disposition. Many trivial faults must be overlooked, strict nursery laws abolished, and care taken not to worry by an excess of careful management. The old lady who was asked by an over-anxious young mother as to what course should be pursued with regard to a child too rigorously disciplined, gave very good advice when she replied,—"I recommend, my dear, a little wholesome neglect."

A child, three or four years of age, seems to possess an instinctive consciousness of its own weakness, and while relying on its guardians for its safety and well-being, is only too readily inclined to lavish all its love in return. At this interesting and engaging period, the young require very careful management; the most common error now committed being either *over-indulgence,* or *over-regulation.* In the first case the parents comply with all the whims of the child, allow his will to have unlimited sway, and are afraid of inflicting just and necessary punishment for fear of impairing the affections. The consequence is, that the child grows up spoilt, selfish, and unloving—for a spoilt child is seldom affectionate; moreover, he is generally unhappy, for the more his whims and caprices are gratified, the more his desires increase, until at last it becomes impossible to indulge them. In the second instance, the parent's inclinations are constantly substituted for the child's; every desire is thwarted: harsh severity is not unfrequently resorted to; and the affectionate and joyful feelings, so delightful to witness in the young, are crushed. Is it to be wondered at if such treatment leads to fretting, peevishness, and bad temper; or to a broken and desponding spirit? The following observations of the late Archbishop Whately are so pertinent, that we need not apologize for quoting them:—"Most carefully should we avoid the error which some parents, not (otherwise) deficient in good sense, commit, of imposing gratuitous restrictions and privations, and purposely inflicting needless disappointments, for the purpose of inuring children to the pains and troubles they will meet with in after life. Yes; be assured they *will* meet with quite *enough,* in every portion of life, including childhood, without your strewing their path with thorns of your own providing. And often enough you will have to limit their amusements for the sake of needful study, to restrain their appetites for the sake of health, to chastise them for faults, and in various ways to inflict pain or privations for the sake of avoiding some greater evils. Let this always be explained to them whenever it is possible to do so; and endeavour in all cases to make them look on the parent as never the *voluntary* giver of anything but good. To any hardships which they are convinced you inflict reluctantly, and to those which occur through the dispensation of the All-wise, they will more easily be trained to submit with a good grace, than to any gratuitous sufferings devised for them by fallible man. To raise hopes on purpose to produce disappointment, to give provocation merely to exercise the temper, and, in short, to inflict pain of any kind merely as a training for patience and fortitude—this is a kind of discipline which man should not presume to attempt. If such trials prove a discipline not so much of cheerful fortitude as of resentful aversion and suspicious distrust of the parent as a capricious tyrant, you will have only yourself to thank for the result."

The business of formally instructing the intellect in children, but especially of the precocious and delicate, must not be commenced too early; for with the mental development, as with the productions of the field, long experience has taught that late springs produce the most abundant harvests. At the same time guardians must not follow the plan of Rousseau, who regarded reading as the scourge of infancy, and who, therefore, would not allow his Emilius to learn a line by heart until he was twelve years old. At first, pictures and simple toys should alone be allowed to teach the appearance of external objects, and to establish a desire for information. Then, as the child reaches its sixth or seventh year, the forms of letters are to be pointed out; care being taken not to tire or disgust. The short-sighted policy which rapidly forces the juvenile mind, without regard to health or happiness, must be unreservedly condemned; for it should be remembered, that premature development of the intellect can only be obtained at the cost of deteriorated constitutional powers. It is the more important that this fact should not be overlooked, since so ignorant are many parents of the laws of health, that when they have done all in their power to destroy the physical strength of their offspring, they most contentedly attribute the result to any cause but the right one: just as, when Dr. Sangrado and Gil Blas killed their patients by repeated bleedings and copious drenches of warm water, they complacently imputed the mishap to their having been too lenient with the lancet, and too chary of their primitive medicine. Instead, then, of setting reason, experience, and the dictates of common sense at nought, parents must learn the few simple laws which regulate the animal economy; and must take care to act in accordance with them, if they would preserve those they are bound to cherish and educate from premature death, from general ill-health, or from the fearful miseries of nervous disorders, which—in all their Protean forms—assail those in after-life whose minds have been cultivated at the expense of their bodies.

While teaching a child the rudiments of book-learning, he should be led to inquire into the reason of things, and the meaning of words; while the habit of accurate observation may be admirably encouraged by directing the attention to some of the marvellous works with which all creation abounds. To inculcate a love of natural history at an early period may be to lay the foundation-stone of much future happiness: as—"the labour we delight in, physics pain,"—so in after days the cares and anxieties, which we are all doomed to encounter in fighting the battle of life, may often be soothed and temporarily forgotten in studying the wondrous truths disclosed by scientific researches.

As the child progresses care must still be taken that the brain be not over-worked by too many or too severe tasks: on the contrary, the pupil should have but little to do, though the teacher must insist upon that little being well done. The studies must also be alternated; and attempts must be made to gradually wean the mind from light and silly associations. Let it not be forgotten, also, to make attempts early to foster the growth of genuine religious feeling:—not the canting religion of dreary Sundays, of assuming solemn looks, of text-quoting, or of uttering long prayers before men, but rather the religion of the head and heart; that true faith, in fact, which leads and aids a man to do his duty to his God, his neighbour, and to himself. The little child who is brought up to repeat short and simple prayers at his mother's knees, has a rule of conduct thereby instilled into him which will probably never be forgotten; and in after-life he may not only look back to these beginnings with feelings of reverence and love, but the recollection of them may serve to strengthen him in some good resolution, and help him to resist many a powerful temptation. Teach the young, also, to hate hypocrisy and artifice: to love sincerity and earnestness; to be straightforward and honest at any sacrifice; to despise vice and wickedness in all shapes, but especially to detest it in the educated, and, above all, when practised under a cloak of religion.

The period of childhood being essentially a time when the heart is inclined to be light and gay, and when very simple pleasures produce halcyon days, all is to be done that can contribute to happiness. Consequently, amusing occupations should be provided, out-of-door pastimes—so congenial to youth—encouraged, and the child allowed to mix with playfellows of his own age. No error can be more ridiculous than that of attempting to force the young to shun innocent recreations, for fear of making them too fond of pleasure. Indeed, by so doing, the very failing which it is desired to avoid, is engendered. The wise parent will be content with showing that no pleasures give so much satisfaction as those which are earned by work; and that pleasure is lost by the continual pursuit of it, or, as Plato eloquently expresses it:—"Pleasure and pain are two fountains set flowing by Nature, and according to the degree of prudence and moderation with which men draw from them they are happy or otherwise. Their channels run parallel, but not on the same level; so that if the sluices of the former be too lavishly opened, they overflow and mingle with the bitter waters of the neighbouring stream, which never assimilate with this finer fluid."

In pursuits and occupations such as we have roughly attempted to sketch time glides away, and the child passes onward to boyhood or girlhood. As the mind becomes stronger so the quality of the mental food must be improved; the studies being extended so as especially to strengthen the memory, to exercise the reasoning powers, to render the mind vigorous, and to promote the general intelligence. At this period must be inculcated lessons of truthfulness, patience, contentment, self-denial, charity, and fortitude: even now may attempts be made to cherish in the child the two attributes which, in the opinion of Epictetus, constituted a wise man—the power of bearing and forbearing. Moreover, early and frequently should it be impressed upon the boy's mind, not only that it is his indispensable duty to excel in whatever may be his pursuits, but that it is undoubtedly in his power to attain a high degree of excellence. An intelligent teacher will endeavour to learn which faculties are too weak in the pupil, and which too vigorous; so that while all are duly exercised, the former may especially be strengthened, and the latter gently repressed. So also the tastes and inclinations of the young should be ascertained; for "the nature of the boy," as Plutarch observes, "is the material to be worked upon, the soil in which the seeds of knowledge and virtue are to be sown."

The increased refinement and cultivation of all classes in the present day renders it necessary—to use a simile of Sydney Smith's—that the mind be accustomed to keep the best company: if only to avoid the mortification of being deemed ignorant and inferior. But there are more powerful reasons for selecting the books which are to be put into the hands of the young with great judgment and caution; for there are numerous writings which prove as destructive to the mind of the young reader as the volume presented by the physician Douban is said to have been to the body of the Grecian king; who—as the Arabian tale relates—imbibed fresh poison as he turned over each leaf, until he fell lifeless in the presence of his courtiers. The books which are most suitable are such as, without forcing the tender intellect, lead to inquiries into the reason of things, and suggest good thoughts; such as promote determination and decision of character; such as show that all great deeds are only accomplished by incessant industry and earnest zeal; such as teach men to excel by lifting up themselves, and not by depreciating others; and such as inculcate pure principles of action, and a horror of cunning, selfishness, and irreligion.

It is unfortunately too true that the most extreme credulity is not inconsistent with the greatest scientific attainments,—that what seems the most absurd and marvellous superstition is not irreconcileable with the highest education, or that the utmost prostration of mind is not incompatible with the loftiest range of intellectual power. Hence, to impart knowledge and to inculcate a love of it, without at the same time teaching its right uses, is only to be compared to playing a game of chance, or to venturing in a lottery, where the chapter of accidents may produce a prize, but where the odds are largely in favour of a blank. It may even be stated further, that superficial, or perverted knowledge, may be a greater evil than ignorance; for, the one makes men powerful demons, the other merely leaves them powerless animals. "A little knowledge," says Bacon, "makes men irreligious; but profound thought brings them back to devotion."

To train a child aright it is certain that severity is very seldom—if ever—necessary; a clear, distinct, kind, but determined manner, upon the part of the parent, being alone required. We are, of course, supposing that endeavours are made to teach by example;

that the influence of kind words—which, when used by those who are loved and honoured, have great weight—is tried; that the lessons imperceptibly taught by the daily life at home are thoroughly sound; and that the softening influence of courtesy and affection is shed over all. The rectitude of the father, the self-denial of the mother, and the earnestness with which both pursue their daily avocations, make a great impression on the youthful mind; and even much slighter incidents, which the thoughtless may only regard as trifles, often serve either to develop good qualities, or to pervert the yet unformed judgment.

Amongst the most important of the quiet lessons taught by home influence, the duties of friendship and relationship may be alluded to; for it is by the proper performance of these duties that life is made happy, and mankind benefited. We would especially teach the young the value of true courtesy to all; the necessity for taking a strictly just view of their own conduct, but a very lenient one of the actions and opinions of others; the importance of attending to the many small and individually trivial, but collectively important laws, by which society is bound together; and the fearful consequences which ensue from encouraging feelings of envy, hatred, and malice. At the same time warnings may be instilled, and observations made to show the true uses of friendship: to teach that he who does a base thing, in zeal for his friend, "burns the golden thread that ties their hearts together." South, we believe, says in one of his Sermons, that sorrows by being communicated grow less, and joys greater: for sorrow, like a stream, loses itself in many channels; while joy, like a ray of the sun, is reflected the more powerfully when it rebounds upon a man from the breast of his friend. The performance of good offices towards our fellows, not only confers immediate gratification, but permanently ennobles our dispositions; and enables us, at the close of the evening, to give a cheerful answer to the question each one should put to himself,—What have I done this day?

Lastly, we would urge, that the youth should be shown by the parent's course of conduct that, as members of society, all men have certain heavy moral obligations which it is incumbent upon them to discharge; and that he will be the happiest—independently of the nature of his occupation, or his station in life—who best performs the duties of his calling, and so fulfils his mission in this life.

CHAPTER V.

DENTITION.

1. INTRODUCTION.—The process of dentition being but a part of the gradual evolution or development of the body, it might be thought that this strictly natural action would always be conducted according to an unvarying law, and that it would be unattended with suffering. This is not the case, however; for although in the majority of instances, the law—corresponding to the law of development which governs the form and position of the organs—is followed, yet it sometimes happens that the normal arrangement is subverted; while few children pass through the period of dentition without experiencing a greater or less amount of local and constitutional disturbance. In proof of part of this statement it may here be mentioned that, though the first teeth usually appear about the seventh or eighth month, cases are recorded where the development is much in advance of that period, while others again are developed very much later, and between these extremes there is every variety of irregularity.

As examples of early development instances are recorded—Haller cites nineteen such—in which one or more of the central incisors have been found through the gums at birth, and have had to be removed to prevent injury to the mother's nipple; while Dr. Crump has published in the *Transactions of the Va. Society of Dentists* an account of a case of full dentition at birth, which was seen by himself in North Carolina.

As regards the opposite condition—tardy development—Dr. Ashburner, in his work *On Dentition and some Coincident Disorders*, p. 42, mentions that he has seen a child twenty-two months old beginning to cut its first tooth, which was an incisor in the upper jaw; the infant being very delicate, with a large head, tumid abdomen, and peculiarly small sized extremities. Serres, again, in his *Essai sur l'Anatomie et la Physiologie des Dents*, quotes the cases of persons who had passed through some years—in one instance, seven—of their lives before cutting their first teeth; while one instance is recorded by Boxalli, and another by M. Baumes, in which the patient reached old age without a single tooth having ever appeared.

The human subject is provided with two sets of teeth—the *temporary*, consisting of twenty, and the *permanent*, of thirty-two; the latter appearing as the former are shed. Some few instances have been related of a third set appearing upon the removal of the permanent teeth; but dentists, without denying the possibility of such an occurrence, do not generally credit it. Deficiencies in the number of teeth are not uncommon; and on the contrary supernumerary teeth have been observed.

2. Eruption of Temporary Teeth.—The germs or rudiments of the teeth appear at a very early period of fœtal life, for—according to Serres—Nature works at their formation almost immediately after conception; so that the jaws of the fœtus at the third or fourth month contain—although in a very limited space—the rudiments of all the temporary and many of the permanent teeth with which the child and the adult are to be supplied. As the embryo grows, so of course the formation of the teeth progresses *pari passu;* but at birth none as a general rule have appeared above the gums. When the child, however, is about seven months old, the two central temporary incisors of the lower jaw make their appearance through the gum; being followed, in a week or two, by the corresponding teeth of the upper jaw. "In a month or six weeks after the eruption of the central incisors we may expect the lateral incisors to make their appearance; those of the upper jaw being evolved first. About the twelfth or fourteenth month the anterior molars of the under jaw are cut, and shortly afterwards those of the upper maxilla. The canines appear between the sixteenth and twentieth; and between the twentieth and thirtieth the second milk-molars pass through the gum. Thus, according to this statement, the twenty milk-teeth are complete by the thirtieth month." (Tomes.)

Hence it will be seen that the temporary, deciduous, or milk-teeth, are twenty in number—four incisors, two canines, and four molars in each jaw: and that usually they are not all cut until the end of the thirtieth month, or even later—the whole period during which they are being gradually evolved being known as that of the *first dentition.*

There are some variations in the period of dentition which seem to correspond pretty accurately with certain constitutional peculiarities—for instance: in the rickety constitution, the process of dentition is always delayed, and it may be altogether arrested for some time. It very commonly happens in a rickety child that the first teeth do not make their appearance till the eighteenth, and sometimes not till the twenty-fourth month. On the other hand, in a tubercular child the first teeth are sometimes cut by the fourth or fifth month, and their subsequent evolution proceeds with great rapidity. Again, in the syphilitic child, contrary to what we might have anticipated perhaps, the teeth are generally cut early and without any difficulty.

3. Eruption of Permanent Teeth.—After the completion of the first dentition at the end of the thirtieth month, there is generally a pause until between the sixth and seventh years; when stronger organs of mastication being required—the second or permanent teeth begin to make their appearance in the elongated and expanded maxillæ. At this period, as Mr. Bell remarks, the jaws

contain no less than forty-eight teeth: namely, twenty deciduous—the whole of which are perfected—and twenty-eight permanent teeth in different degrees of development within the jaws.

In considering the mode in which the permanent teeth appear, it must be remembered that the twelve true molars are not preceded by temporary teeth; and hence these teeth are cut like the teeth of the first dentition, not by displacing the latter. In short, as the growth and expansion of the jaw permits, the first four molar-teeth begin to appear at the back of the existing milk-teeth, and usually before any of these have fallen out; being followed at a later period, as the jaws grow, by the second four molars, and subsequently by the third four, or wisdom-teeth. The remaining permanent teeth are thus cut: as the period of second dentition approaches, the bony partitions separating the sacs of the permanent from those of the milk-teeth are absorbed; the fangs of the milk-teeth are also removed by absorption; and the permanent teeth, now placed directly under the loose crowns of the temporary ones, gradually rise up within the alveoli, push up the milk-teeth until they become loosened and detached, and thus take their places.

The periods of eruption of the permanent teeth, though liable to some variety, are generally somewhat as follows: the anterior true molars at six and a half years of age; the central incisors and the lateral incisors, at eight; the anterior and posterior bicuspids at nine and ten; the canines from eleven to twelve; the second true molars from twelve to thirteen; and the last molars—or wisdom teeth—from seventeen to nineteen. It may be remarked that the teeth of the lower jaw are generally earlier by four or six weeks than those of the upper; and that any irregularity in the time of appearance of the permanent teeth need give rise to no anxiety.

Thus, we see, that when the permanent teeth are all developed there are sixteen in each jaw, viz., four incisors, two canine, and four bicuspids, all of which make their appearance by displacing the temporary teeth; and six true molars which are cut in the same way as the temporary teeth were. It should be noticed, moreover, that the rudiments of the last true molars, or wisdom-teeth, are probably not even developed until after the first true molars have appeared through the gums.

4. Disorders of the First Dentition.—Perfectly healthy infants, in whom the powers of life are energetic, may cut their teeth without any perceptible disorder; but in the majority of cases there is not only some local irritation, but a greater or less amount of general disturbance. It must not, however, be supposed that the process of dentition is in itself a disease, though this idea is too commonly entertained. Dental evolution is no more a disease than is the ossification of a long bone. It is, nevertheless, a very delicate indicator of the child's constitutional condition, and as such is capable of affording to the experienced observer much and valuable information. Moreover, where constitutional peculiarity exists, and

where a tendency to disease is latent, the process of dentition, with its attendant nervous excitability, may prove the immediate exciting cause of some grave disorder: in all this, however, it is, as it were, but the spark to the flame which burns only on some previously existing morbid material, or is fed by some morbific agency.

The following is perhaps the more usual course in children who are not strictly healthy:—before the tooth appears through the gum, the latter is found to be hot and swollen; there is an increased flow of saliva: the cheeks frequently become flushed; the child is restless, capricious, and fretful, and constantly thrusting its fingers, or any hard substance it can obtain, into its mouth, in order to allay the excitement and irritation of the gums; the sleep at night is broken and disturbed; the appetite fails; and there are symptoms of intestinal disturbance, evidenced by attacks of vomiting and diarrhœa.

In still more unfavourable cases the general derangement is greater; the restlessness is sometimes extreme, the skin hot and dry, the mouth parched and often covered with aphthæ, the tongue foul, and the appetite very bad—so that the child either refuses the breast, or takes it only for a minute or two at a time, and at irregular intervals. Unfortunately, too, the process may become complicated by the occurrence of some important sympathetic affection, or of some independent disease.

We can readily imagine that, in the excited condition of the system arising from dentition, acute inflammation may easily attack any organ in the body; and such is really the case, for inflammatory diseases of the brain and nervous system, as well as of the organs of respiration, are by no means uncommon. Severe bowel complaints are also rife at this time; there is often dysuria; cutaneous diseases are not unfrequent; spontaneous salivations arise; and spasmodic affections—varying from mere twitchings of the muscles or sudden startings during sleep to severe epileptic convulsions—often justly give rise to great alarm in the minds of the parents.

Diarrhœa is, perhaps, one of the most common disorders connected with dentition, and especially so in the seasons of summer and autumn. The reason of this is no doubt partly to be found in the fact that the mucous membrane of the intestinal canal is at this time undergoing a special development as regards its follicles and glandular structures, so that it is the more readily irritated. Besides this, dentition begins just at a time when the child's food is being changed from a purely milk to a farinaceous or even richer animal diet, and thus its digestive powers are taxed perhaps too severely.

This variety of diarrhœa differs in some respects from that which occurs at other periods. It is often characterized by greater febrile disturbance, with a good deal of thirst, and seems to be rather more intractable than that brought on by other causes. The child suffers more pain apparently, and is often much reduced by the persistance of the attack—not unfrequently too, as Dr. West has remarked, the pulmonary mucous membrane is similarly affected, and catarrh or even bronchitis coexists.

Any local obstacle to the progress of dental development, such as may arise from induration or inflammation of the gums, or from any disproportion between the size of the jaws and the form or number of the teeth, greatly augments the constitutional disturbance. Occasionally, in debilitated subjects, the summit of the gum over a tooth, or the edge of the gum when partly pierced by a tooth, becomes the seat of painful inflammation and ulceration; producing an affection which has been described by some authors under the name of *Odontitis Infantum.* The pain of this inflammation is sometimes so severe, and tends so much to augment the fever and general disturbance, that the child's life may be placed in imminent danger.

With respect to the cutaneous eruptions connected with dentition, they often seem rather to give relief than otherwise; and hence they need not be treated too actively, at all events not at first. The different forms of eczema, strophulus, herpes, and simple erythema, may of course occur independently of dentition; but it is also certain that they often make their appearance just before the cutting of a tooth, and that they disappear or become milder after the process is completed.

When the process of teething goes on favourably, it need hardly be said that medical interference will be unnecessary. The child should be as much as possible in the open air, provided the weather be favourable; the head should be sponged daily with cold or tepid water; caps and warm coverings to the head should be forbidden, as they sometimes seem rather to favour determination of blood to the brain and its membranes; the gums should be gently rubbed with the finger or with a hard crust to lessen the irritation; the diet should be simple; and the bowels should be kept perfectly regular.

Dr. John Clarke, in his "Commentaries on the Diseases of Children," ascribes most of the disorders which accompany dentition to over-feeding and consequent plethora; to improper kinds of food, which produce irritation; and to keeping the head too warm. He asserts that coolness of the head, and washing it daily with cold water, renders children much less liable to illness during this period. Spontaneous salivation and moderately lax bowels are also considered by him as favourable occurrences, for he thinks that they tend materially to diminish irritation; hence, he advises that gentle aperients should be given, especially in the case of plethoric children, as well as in those with cutaneous eruptions.

When dentition is difficult, its management becomes more important, and there are two indications which should always be followed: first, to relieve local irritation; and secondly, to subdue constitutional disturbance. If, on examining the mouth, the gum is found to be hot, red, tender, swollen, and indurated, the practitioner may feel pretty certain that this condition is in some way connected with the general symptoms; and consequently, that if he relieves the local condition, some at least of the symptomatic fever will disappear. The question therefore is as to how that relief may best be obtained; and, as regards local treatment at least, this question resolves itself very much into this, whether or no the gum is to be lanced.

There can be no doubt, for the accumulated experience of the profession is very unmistakeable on this point, that when this operation is properly performed in suitable cases, immediate relief often follows; at the same time, it must also be conceded that this proceeding is far too empirically adopted, for we have often seen cases in which lancing has been freely indulged in, and yet no tooth has been even near the surface of the gum. Two conditions seem to be essential to justify the use of the gum lancet; either the gum itself must be in such a state of congestion and inflammation as at once to suggest the necessity for some relief *to the vessels* in that situation (not to the tooth, for it is absurd to suppose that a tooth can be so bound down by the delicate mucous membrane above it as that it cannot escape): or else the general condition of the child should be one which would warrant any experiment likely to give relief, as, for instance, if he were suffering from frequent and apparently causeless convulsions. According to each state, so scarification or cutting down to the tooth is to be adopted. If after this proceeding the general disturbance persists, mild laxatives must be resorted to, and if there is much fever, with constipation, cooling salines, with occasional sedatives, will do good. Where there is much thirst the child may be allowed to drink freely of cold water; where there are symptoms of determination of blood to the brain, warm baths with cold applications to the head will be useful: and where symptoms of debility predominate, mild tonics will do great good: in all cases we must take care to keep the secretions and alvine evacuations healthy, resorting to mild aperients if constipation exists, or on the contrary, to astringents if the child is being weakened by diarrhœa. Sometimes the diarrhœa which occurs in the process of dentition is exceedingly troublesome, and by its persistence leads to great prostration. Astringents will generally have a decidedly beneficial effect upon the profuse mucous discharge, and their value will be enhanced by the combination of some sedative to diminish the nervous excitability; one drop of chlorodyne to a child a year and a half old we have found of great service, and the aromatic chalk and opium powder in one or two grain doses is a highly efficacious remedy. Sometimes a warm linseed meal and laudanum poultice applied over the bowels for a few hours will do great good.

Now and then we have seen cases in which dysuria has existed to a very troublesome degree, and apparently with no other cause than that nervous excitability which is engendered by painful and difficult dentition; it seems to induce a state of spasmodic stricture, which is only relieved by the use of a hot bath. In other cases, and these are far more common, a state of incontinence of urine results, which is often exceedingly difficult to remedy.

Should the irritation of the gum run on so as to give rise to inflammation and ulceration—odontitis infantum—chlorate of potash must be administered in often repeated doses; while solutions of borax or of nitrate of silver—vide Formulæ—are applied to the affected part. Some practitioners recommend the application of leeches to the gum, and the free employment of antiphlogistic remedies; but their use will not, we believe, be attended with much success in the present day.

One word as to the management of the various cutaneous eruptions which are so frequent during dentition, especially those of the vesicular or pustular kind, and notably eczema and impetigo. When these or any other appear upon any part of the body in an acute form, they are best left pretty much to themselves, at all events, for a time: we have frequently seen attempts to cure them quickly succeed admirably, so far as regards the eruption, but very badly indeed in the effects produced elsewhere, either in the form of convulsions or some other grave disorder. Where, however, the cutaneous eruption is of long standing and has existed, perhaps, previously to the eruption of any teeth, then most likely it is maintained by the irritation of the teething, is a consequence of it, and being in no sense a relief, it may be treated with a view to cure, if that can be accomplished.

In the management of the more serious diseases which sometimes complicate the process of dentition, it is only necessary to say that the same rules must be followed as in the treatment of these affections at other periods. Such cases will of course be more alarming because of the complication; but this should only make the physician more watchful, and more cautious in the use of lowering measures. Care must also be taken to notice the condition of the gums, so that if they become inflamed from a presenting tooth, they may at once be lanced.

5. Disorders of the Second Dentition.—The eruption of the permanent teeth does not usually give rise to any distress; although instances occasionally occur where there is not only much local irritation, as evidenced by great pain in the gums and enlargement of the parotid and sub-maxillary glands; but also where serious general disturbance ensues, as shown by the occurrence of epilepsy, severe ophthalmia, cutaneous diseases, &c. The cases usually attended with the greatest amount of distress are those where—the maxillæ being insufficiently developed—the molar teeth are cut with great difficulty and pain, thus producing fever and derangement of the digestive organs: or where, from general impairment of the health, the constitution sympathizes keenly with the slightest irritation in any part of the system: or where the first true molars are cut during the progress of any severe disorder. Dr.

Ashburner relates several examples of severe convulsive diseases caused by difficult dentition; all or most of which seem to have been cured by the free use of the gum-lancet. The following case may be quoted as a good example of the success of this practice in the hands of this physician:—A boy, twelve years of age, was cutting the second, or posterior permanent molars of the upper jaw, before those of the lower, and the process was accompanied by twitchings of various parts of the body. At last he became affected with chorea. Being a very nervous lad, if any notice were taken of him, he would involuntarily make the most extraordinary grimaces, and contort his body into various attitudes that appeared to be most difficult and painful. This chorea contiued for three months, during which time a variety of medicines were swallowed. At last he fell into an epileptic fit, struggling much, foaming at the mouth, and grinding the teeth. On introducing the fore-finger along the inside of his cheek, a hard cartilaginous space was found on each side, behind the first molar-teeth. These parts were freely cut, when the boy uttered a scream, and fell out of his fit, becoming quite sensible; nor had he afterwards any recurrence of the chorea.

From the foregoing observations, it is clear that the management of children, during the process of dentition, requires very great care and skill on the part of the attendant; there is no period or condition of childhood in which the symptoms are so various, none requiring greater discrimination and tact, and it is earnestly hoped that the student will above all things not regard lancing of the gums as the panacea for every ailment that a child may suffer during the process of dentition. The gum-lancet is not to be used without full consideration, nor without some definite object, and should never be resorted to merely to hasten the process of dentition; such practice is not only unscientific, but is often positively mischievous. When the superimposed gum is tense, shining, tender, swollen and congested, and is attended with salivation and heat of mouth, then the lancet will often give great and almost immediate relief. And further, if called upon to treat some constitutional affection, occurring during the process of dentition, the practitioner will be quite justified in lancing the gums if the symptoms are such as lead to the belief that the pressure of the tooth in the jaw is producing morbid sympathies, and thus increasing the general disturbance; or, if he concludes, after full consideration of all the phenomena, that the irritation of the tooth is really the *fons et origo mali*, he had better cut down upon it at once, for it may be that relief will follow, less perhaps from the vessels being freed of their tension, than from the division of some minute nervous filament, and certainly not from any assistance rendered to a growing tooth through the gum.

6. Mode of Lancing the Gums.—The incisions for the incisor and canine teeth should consist of a single straight cut along the gum, whilst those for the bicuspids and molars should

consist of two cuts in the form of the letter X. It has been advised that the incisions for the lower jaw should be inside the median line of the gums, to favour the eruption of the teeth backwards; whilst those for the upper jaw should be in front of this line, to induce the teeth forwards, and as a means of obviating the disfigurement of what is popularly known as "under-hung," *i.e.*, the lower projecting in front of the upper set.

CHAPTER VI.

THE PATHOLOGY OF INFANCY AND CHILDHOOD.

DURING the period of infancy and early childhood, there not only exists a predisposition to disease, owing to the weak organization of the system, and the ease with which impressions are made; but the maladies of this time of life are severe and often insidious in their nature, they soon give rise to organic change, and they run their course with a rapidity of action not seen in the adult. New symtoms, too, succeed each other very quickly, and complications soon arise. As might be expected, then, there is more sickness in infancy than at any other epoch. The activity of the vital powers generally, the quickness and force of the circulation, and the abundant way in which blood is supplied to the various tissues, account for many of the disorders assuming an inflammatory type, for the readiness with which serum or lymph is effused, and for the intensity and danger of the reaction; while the great susceptibility of the nervous system causes all, even local, affections, to be very severely felt by the whole system. Hence even apparently slight indisposition in an infant ought not to be regarded as trifling. At the same time, it is indisputable that this activity of the vascular and nervous systems confers an energetic reparative power upon the infant, and most materially aids it in recovering from some severe affections, which would often prove fatal to one of more advanced age.

The skin, the mucous membranes of the respiratory organs, and the digestive tube, being the principal surfaces upon which morbid impressions are received in the infant, are consequently those in which disease usually commences. It seldom, however, long remains confined to these tissues, but sooner or later is reflected upon other and often distant organs; thus either increasing the extent of morbid action, or changing its situation by gradually ceasing at the part where it arose, as it augments in severity in the tissue secondarily affected. In this manner diseases of the skin, alimentary canal, and respiratory organs reciprocally produce each other; and thus we may account for the coexistence and intimate relation between inflammation or irritation of the mucous membrane of the digestive canal, and an analogous state of disease in the brain and its membranes; or for the supervention of the latter upon the former, as is so often witnessed. The popular dread of the suppression of cutaneous eruptions giving rise to disease of internal organs, is founded upon the frequency with which metastasis is seen to occur in the diseases of children. We also find, in the mucous membranes especially, that when morbid action is once set up, it has a great tendency to spread rapidly along the whole of the affected tissue, unless promptly arrested by appropriate remedies. Thus, it is seldom that inflammation of the fauces and pharynx does not extend some distance into the œsophagus; or more unfortunately into the larynx and trachea; or that the false membranes exuded in croup do not reach to the bronchial tubes. The same remarkable occurrence takes place in the gastro-intestinal mucous membrane; all inflammations of which exhibit a strong tendency to spread downwards.

The *skin* being very vascular, delicate, and excitable, is peculiarly liable to irritating and unsightly—if not dangerous—disease of various kinds, from the simplest rash to the most violent inflammation; and from causes, too, which at a later period would produce no morbid effect. Many of the cutaneous affections of early life depend upon a morbid state of the stomach, some are owing to a neglect of cleanliness, others are the result of irritations directly applied to the surface, while the most important—the eruptive fevers—are due to morbid poisons. Most of the exanthematous fevers, and especially measles, are, as a rule, confined to the periods of infancy and childhood, and for the most part they occur only once in the same person.

The *mucous membrane of the larynx, trachea, and bronchial tubes*, is in early life peculiarly liable to inflammation of various grades, though generally it assumes an acute character. Laryngitis, pneumonia, and pleurisy are also not unfrequent, while bronchitis and croup are perhaps, of all the severe affections of childhood, those which are most commonly met with.

From the careful returns of the Registrar-General, it appears that the mortality in children from *diseases of the respiratory organs* is very high: nor need we be surprised at this when we consider how much they are exposed to evil influences, how singularly susceptible they are to these influences, and, owing to their complex structure and their high vitality, how great and rapid are the morbid changes which take place in them. It is in this latter respect, as regards the period of early life, that their chief peculiarity consists. As compared with other functions, the activity of the circulation and respiration, but notably the latter, is certainly disproportionate to the age of the child: thus, whereas in the adult the pulse averages 75 and the respiration 16 in the minute; in the infant, on the contrary, the latter may range from 40 to 80 in the absence of any disease, while the former seldom reaches more than from 120 to 140. It must be remembered, however, that rapid respiration is no measure of the activity of that function; on the contrary, there is evidence to prove that in a state of health the animal heat, which is some test of respiratory activity, is higher where the respirations are less frequent, so that rapid respiration is indicative rather of feebleness than strength, and so has a practical significance in the pulmonary diseases of early life. That weakness is really the essential characteristic of infantile breathing is further proved by the fact that auscultation reveals only the faintest murmur; the smaller air-cells are with difficulty inflated, and this difficulty is caused, partly by the elasticity of the chest wall which opposes a barrier to respiration, and partly by the elasticity of the lung itself. The latter is a point of special importance in infantile pulmonary diseases, for where the bronchial tubes are choked with mucus, the feebleness of respiration increases the difficulty of overcoming this obstruction, and collapse of the lung in the parts beyond may result from the mere elasticity of its tissue.

The *gastro-intestinal mucous membrane* is another common seat of disease at the time of life we are considering ; a slight excess of food, or food of an improper nature, vicissitudes of temperature, damp or vitiated air, readily produce aphthæ, sickness, purging, flatulence, colic, and even acute or chronic inflammation. Not uncommonly the inflammation extends to the mesenteric glands, or these become affected from constitutional causes, rendering the blood unhealthy ; .enlargement and disorganization of these glands, with great distension of the abdomen, and extreme general emaciation then result, producing the disease known as tabes mesenterica. Tubercular deposits also occasionally occur in the pancreas.

Among the lower classes certainly, and with the upper classes probably, there is no more frequent cause of disease of the digestive organs in children than improper feeding: this is traceable entirely to ignorance of the physiology of digestion, and of the requirements of infant nutrition. Food is given of a kind which is not only not required by the conditions of infant life, but which it is utterly impossible to digest by reason of the at present undeveloped state of the digestive organs: the consequence is that it becomes so much foreign material, which speedily decomposes, and both it and the gases evolved act as irritants to the alimentary canal, the peristaltic action of the muscular coat is increased, the mucous coat being irritated pours out a good deal of mucus, and diarrhœa with offensive evacuations is the result. In this process, not only the indigestible but much of the digestible food is purged away, and, partly by reason of the general irritation to so delicate an organization, partly owing to defective sanguification, the child is most imperfectly nourished, and emaciation or atrophy is brought about.

But further, between the stomach or alimentary canal and the *brain or nervous system* there is so intimate a relation, that severe functional disturbance—a prelude often to organic disease—of the former is a not unfrequent result of derangement of the latter, through reflex action.

Again, frôm causes already mentioned, the circulation through the *brain* may be easily deranged, and hence we get congestion, inflammation, spurious hydrocephalus, and convulsions. Convulsive disorders arising from functional disturbance of the brain or spinal marrow are often the result of irritations transmitted from the digestive organs, and will only cease upon their removal. We have also known fatal convulsions or dangerous cerebral irritation excited by sudden alarm. Epilepsy and chorea occur during the period of childhood, rather than in the earlier months of infant life; and according to Sir Robert Carswell, tubercle in the brain is more frequent in young infants and children than at other periods of life, giving rise to acute hydrocephalus, with convulsions, paralysis, coma, &c.

Diseases of the *urinary organs* are neither frequent nor severe, but a disordered state of the urine, or an increased secretion of it, may arise from derangement of the digestive organs, or from the irritation of teething. There does not appear, however, to be any special liability of idiopathic disease of the urinary organs in childhood; but the frequency of scarlatina at this period, and the known tendency to acute nephritis and albuminuria during the desquamative stage of that affection, accounts for the occasional occurrence of that disease. Incontinence of urine—so often troublesome in childhood—may result from habit, or from nervous irritability causing an augmented secretion, or from irritations seated in the lower part of the intestines, such as ascarides, which is a very common cause of this affection, or from preternatural irritability of the mucous membrane of the bladder, or from want of due control over the vesical sphincters.

The early development of the *lymphatic system* and its extreme activity seem to be the predisposing causes of disease in early life; and we find consequently that enlargement and inflammation of the lymphatic glands is not uncommon, that strumous affections show themselves in all their various forms, and that tuberculous affections of the mesenteric and bronchial glands are especially rife.

The tendency to disease in any organ in early life appears to be in a remarkable way proportionate to its rapidity of development and to its functional activity. Hence the reason why diseases of the brain and nervous system form so prominent a feature in the mortality of childhood. During the first two years the brain nearly doubles its weight, and it is during the first five years that the mortality from diseases of the nervous system is so extraordinarily high.

With regard to the *fevers* incidental to childhood, it is most important that we should recognize their true character and have clear ideas of their pathology. It cannot be doubted that the various fevers which have been thought to be incidental to children have no foundation in fact; the terms gastric fever, infantile remittent fever, worm fever, and the like, ought now to be discarded as unscientific, and as the relics of an age characterized by imperfect clinical study. In their stead we must introduce, as the mark of a truer pathology, the terms *typhus* and *typhoid*, applied to the state of *continued* fever, and we must also recognize the undoubted existence of the true *intermittent* variety. These are the only specific fevers of which we can note the existence, excluding from consideration the more irritative fever of inflammation, with which they have little or nothing in common, and which is the heritage of all acute inflammation, and disregarding also the various febrile conditions incidental to other diseases: these all are but accidents, as it were, of other and more important pathological states, and so far they differ from those truer and more definite fevers above referred to, in which the group of symptoms constituting what we call fever is of the very essence of the disease.

The diseases of infancy, then, present many interesting and remarkable features, the peculiarities decreasing as age advances. Thus, although cutaneous diseases are common during childhood, yet as the skin becomes less sensitive and irritable, so it also becomes less liable to suffer from slight causes; furunculi, however, or circumscribed phlegmonous inflammations of the skin are not uncommon to puberty. So again, the mucous membranes readily suffer from inflammation during youth; while from the great development of the capillary system, and the tendency to hyperæmia and to irritation of the respiratory mucous membrane, there is a liability to hæmorrhages from the nose and lungs. Tubercular disease of the pulmonary organs is often developed during childhood, and scrofulous swellings and ulcerations of the superficial lymphatic glands are of common occurrence. Lastly, the brain, from the great activity of its functions, is peculiarly exposed to disease as the child grows older; and hence severe headaches and general disturbance of the cerebral circulation are frequent.

The *direct causes of disease* are nearly the same during infancy and childhood as in the subsequent periods of life, though it must be remembered that they act upon the child with much greater severity than upon the adult. Errors in diet, impure air, inattention to cleanliness, extremes of heat and cold, improper clothing, exposure to the contagion of morbid poisons, excitement of the nervous system from alarm or paroxysms of anger, the irritation of dentition, and the presence of worms in the alimentary canal, these, together with such accidents as blows, falls, &c., make up a category of fertile sources of mischief to the young, as they or some of them are to persons in after-life. Their evil influence is, however, all the greater in early life; first, because of the delicacy of the organism; secondly, because of the rapidity of growth and developmental change; thirdly, from the extreme sensitiveness of the nervous system, and its special liability to sympathetic disturbance; and lastly, because there is in early life a special tendency to the development of hereditary disease, which may in after-life be, as it were, outgrown.

Many of the disorders that occur in early life may exist at birth:

thus children are occasionally born affected with syphilis, small-pox, tuberculosis, scrofula, softening of portions of the stomach and bowels, inflammation of the different organs, &c.; or they may be born convalescent—but very weak—from some disease that has assailed them during intra-uterine life; or there may exist from birth a peculiar condition of the organism, predisposing it subsequently, from the action of slight causes, to a particular form or class of diseases. This condition of organism may exist in all the children of certain families, and would appear, in many cases, to be hereditary—the same diseases prevailing, for many generations, in the same family.

The *chief causes of death*, in children under five years of age, are thus detailed in the Report of the Registrar-General, premising that the total number of deaths, from all causes, under five years of age, is 111,729 males, and 94,824 females, or a grand total of 206,553, of which number 158,231 of both sexes were registered under the following heads, at the several ages stated :—

Causes of Death.	Total under 1 Year.	1	2	3	4	Total under 5 Years.
Zymotic Diseases .	29,708	14,481	8,297	6,165	4,587	63,238
Constitutional „ .	8,781	5,005	1,916	1,059	817	17,578
Local „ .	50,770	15,721	5,745	3,137	2,042	77,415

The "local diseases" are thus further classified according to the organs involved :—

Causes of Death.	Total under 1 Year.	1	2	3	4	Total under 5 Years.
Diseases of Nervous System	22,783	4,128	1,643	1,054	665	30,273
„ Circulatory „	153	51	41	48	45	338
„ Respiratory „	23,774	10,789	3,658	1,673	1,044	40,938
„ Digestive „	3,334	481	214	194	134	4,357
„ Urinary „	102	109	108	95	93	507
„ Generative „	4	2	1	1	1	9
„ Locomotive „	54	59	44	48	43	248
„ Integumentary „	566	102	36	24	17	745

CHAPTER VII.

THE SYMPTOMATOLOGY OF DISEASE IN CHILDHOOD.

It is not unfrequently asserted, by way of reproach, that the profession of medicine is merely a conjectural art; and practitioners are sometimes reminded that some of their predecessors have rejoiced at being able to retire from a harassing life, because they were weary of guessing. Allowing that the observation contains a certain modicum of truth, it is, nevertheless, quite clear that there is a vast distinction between the conjecture of the scientific physician and that of the rash and ignorant empiric: for whereas the one either surmises by rule, and by a process of reasoning for each step, of which he can show the why and the wherefore, or else by a ready perception acquired only by extensive practice and study: the other, on the contrary, merely makes a haphazard guess which—to say the least—is as likely to be incorrect as not.

But it may certainly be asserted in the present day, that, with regard to the diagnosis of disease, guess-work no longer prevails; we have in the stethoscope, the microscope, the ophthalmoscope, the test-tube, and the thermometer, instruments which afford us the most trustworthy information in diagnosis. So, again, the knowledge which we now possess of the minute structure and functions of the various organs and tissues of the body, gives us immense advantages in rectifying morbid processes when they occur. But not only are we intimately acquainted with the nature and mechanism of the complex machine we have to keep in order, but we also study much more closely than our ancestors did, disease at the bedside; hence we are becoming better acquainted with the natural history—so to speak—of the latter, while we are also learning the true value of remedies. It is unquestionably by the watchful study of disease at the bedside that we shall best obtain that information which can alone lead to the successful treatment of disease. In order to study disease aright, we must go to the bedside with an intelligent eye, an acute ear, and a sensitive touch—in a word, we must know something of what we are to expect, and we must possess that knowledge which will enable us to interpret rightly the various phenomena presented to us.

In the following observations the reader must not expect to find more than certain general truths, derived from a scrupulous and comprehensive survey of disease, briefly expressed; since the extent of the subject renders it imperative that our remarks should be confined to succinct assertion, where, probably, vivid illustrations would be more easily impressed upon the mind.

Nowhere, perhaps, does the practitioner so much stand in need of a certain indescribable tact, as in investigating the disorders of childhood. In many cases it is absolutely necessary, to insure success in treatment, that an early and correct diagnosis should be made; while at the same time, the means of making this diagnosis are in many respects totally different to those which are practised in the diseases of adults. In the first place, it is by no means easy to understand a helpless infant, for his only language is a language of signs, which nothing but habit, experience, and patience will enable us to interpret; and, in the second place, a sick child is not only peevish and restless, but, as medical men, we see him under strange and unusual circumstances, hence part of his condition at the time of the examination may arise from our alarming, or exciting, or fatiguing him. As Dr. West justly says, in his admirable *Lectures on the Diseases of Infancy and Childhood:*—"You cannot question your patient, or if old enough to speak, still, through fear, or from comprehending you but imperfectly, he will probably give you an incorrect reply. You try to gather information from the expression of his countenance, but the child is fretful, and will not bear to be looked at; you endeavour to feel his pulse, he struggles in alarm; you try to auscultate his chest, and he breaks out into a violent fit of crying."

There is no department of practice in which it is so important to study manner and bearing towards the patient, as in treating children's diseases. Our great object should be to win their hearts, for if we can gain their love our task will be comparatively easy; while without this our difficulties will be well nigh insuperable: but by patience and good temper, by a quiet demeanour and a gentle voice, all may be made to go well, and we may accomplish everything that is desirable. One great point is to be careful not to alarm the patient: on entering the room we must be satisfied to gain quietly the previous history of the case from the mother or nurse: taking care to inquire especially into the character of former attacks of sickness, and whether any of the eruptive fevers have been passed through. We should inquire also into the circumstances under which the present illness has come on: its early symptoms; whether these appeared suddenly, or insidiously, or after exposure to contagion; the day of attack; and whether anything strange had been previously noticed in the child's manner or appearance. Having obtained information on these topics, we inquire the child's sex and age, the nature of its food, and if an infant, whether it has been weaned, the state of the bowels, together with the nature of the evacuations, and how and to what extent it sleeps; while at the same time, without appearing to do so, we examine the expression of the eye and countenance, the attitude, and the character of the respiration, &c. By this time the little sufferer will have become somewhat accustomed to our presence, and we may advance to the bedside to examine him more closely. We shall now be able to ascertain if any inflammation exists about the eyes or nostrils, whether the body is plump or wasted, and the condition of the skin with regard to dryness, colour, and the existence of any rash or eruption; while by gently taking hold of the child's hand, and applying the index finger to the radial artery, or by lightly placing the hand on the forehead we may feel the temporal artery, and so learn the character and frequency of the pulse.

It is important to learn the frequency of the pulse and respiration as early as possible in the visit, provided the little sufferer does not object, as otherwise, if he becomes alarmed or fretful, both will be quickened, and the result consequently be unreliable. We should also notice the state of the scalp and fontanelles, the presence or absence of abdominal pain or tenderness on slight pressure, the existence of any hernia, the temperature of the surface, the position of the limbs, whether motionless or tossed about, rigid or relaxed, whether the hands are clenched, the thumb turned in, or the toes bent downward; and by a little management, after awhile, we may be able to auscultate the chest.

In practising auscultation, it should be remembered that immediate is generally to be preferred to mediate auscultation in these cases, since the pressure of the stethoscope frightens, if it does not hurt the child. It is always best to listen to the chest before resorting to percussion, because the information obtained is so much more important, and it may be that the child will resist even the gentlest percussion: great care must, however, be taken not to strike too sharply, the variations in resonance being more readily appreciated by a gentle stroke; while it is almost unnecessary to add that mediate percussion must be used—that is to say, the blow must fall on the finger or on an ivory pleximeter, and not on the chest walls. Comparison should be made not only between the corresponding parts of both sides of the chest, but also between the upper and lower parts of either side. In acute diseases it is advisable to commence by examining at the base of the lungs; in chronic diseases we should first auscultate at the apex.

The position of the child is a matter of some importance in auscultation; it should be placed quite "square," and the same position should be maintained throughout the examination. The practitioner will also remember that owing to the position of the liver, as has been pointed out by the late Dr. Hillier, "during expiration, especially if forced, the base of the right lung is considerably duller than the base of the left."

As regards the value of auscultation in the pulmonary affections of very young children, we need only here mention that though in many such cases it is of comparatively little value, while in all, less reliance can be placed upon the signs derived from its practice than in the diseases of the adult; yet at the same time no diagnosis can be complete without a careful chest examination in cases presumably of a pulmonic character.

To examine the throat, when deemed necessary, some such manœuvre as that adopted by the celebrated Gölis must be tried. While playing with the infant, pass the little finger between its jaws as far as the base of the tongue: an effort will then be made as if to vomit, during which—having previously taken a proper position as regards the light—the physician may seize the oportunity of making the inspection.

Lastly, the state of the tongue, the condition of the gums, and the number of the teeth, if any, remain to be ascertained; it being generally better to defer this inquiry to the last, since, as Dr. West teaches, it is usually the most grievous part of the medical visit.

In conducting the examination of a child whom we are seeing for the first time, we should be very methodical in our manner as well as in the questions put, as this not only facilitates the investigation, but inspires confidence in the parents or friends. We should inquire minutely into the child's past medical history, and as to any hereditary or other constitutional tendency. Then, as to the exact date and mode of commencement of the present illness, whether there be any epidemic, or any infectious diseases in the neighbourhood, and whether any improper food has been given; lastly, and specially, inquiry should be made as to the state of dentition, as this will often explain an otherwise mysterious illness.

It only remains, before leaving the room, to examine the urine, if it can be obtained; the matters vomited, if any; and the evacuations from the bowels: the practitioner will then be in possession of all the materials necessary for forming his diagnosis. The value and import of the symptoms thus observed will be best estimated by careful consideration of the following observations on the several points already briefly alluded to. But before examining these it may be well to call to mind—1. That epidemics vary much in their intensity, being occasionally very mild, and at other times severe. Hence, before forming a prognosis in the case of any zymotic disease, the character of the prevailing epidemic must be taken into consideration. 2. Diseases of the nervous system are very fatal to children, acute hydrocephalus or tubercular meningitis being especially dangerous, and trismus nascentium scarcely less so. 3. A guarded opinion should be given in those affections which are due to any hereditary predisposition, as well as in diseases occurring in scrofulous or tuberculous children. 4. The symptoms of any given disease are often masked or complicated by the improper administration of purgatives, soothing poisons, or other powerful medicines. 5. Some hours before death, a total remission of the symptoms not unfrequently occurs, especially in the cerebral diseases of children; consciousness being restored, and the countenance becoming brighter and more natural. The practitioner who mistakes this change, and gives a favourable opinion from it, will not be likely to increase his reputation. Beware of giving up all hope in any case which is not actually *in extremis*; for not only do young children often rally from the most severe disorders, but if we once pronounce the case hopeless, the attendants will cease to administer the remedies, and thus even the faintest glimmer of hope will be frustrated.

We may now consider critically the value of the symptoms presented by an examination of the countenance, the gestures and attitude, the sleep, the cry, the mouth and breath, the abdomen, the general surface and temperature, the respiration, the circulation, and the discharges by the mouth, bowels, or bladder. This will embrace the whole subject of the symptomatology of children's diseases, and will include also somewhat of the diagnosis and prognosis.

The Countenance.—Four principal indications—speaking roughly—are presented by the study of a child's physiognomy. 1. In general uneasiness, excitement, and fever, the whole expression of the countenance is altered: a flushed and heated condition, with occasional wrinkling of the features, being chiefly remarkable. 2. In affections of the brain and nervous system, the expression of the upper portions of the face—the forehead, brows, and eyes—is especially changed; the forehead being contracted and heavy, the brows knit, and the eyes wild and vacant, or fixed and staring. 3. Morbid conditions of the organs of respiration or circulation affect the features of the middle of the face, the nostrils being rendered sharp and distended, while a dark circle surrounds the mouth and eyes. 4. In disease of the abdominal viscera a peculiar expression is given to the cheeks, mouth, and lips; the cheeks appearing sallow and sunken, the mouth retracted or drawn, and the lips colourless or brown.

In addition to the above there are, according to M. Jadelot, and we have ourselves verified his observations in many though not in all points, certain well defined *lines* or "traits" in a child's face which may be taken as roughly indicative of disorders of the several viscera. For instance, a line called by him the *oculozygomatic*, which runs from the inner angle of the eye downwards and outwards to the malar bone, was regarded by him as indicative of cerebro-spinal disease, actual or sympathetic. A second, called the *labial*, running from the angle of the mouth downwards and backwards, he considered was indicative of pulmonary disease. A third, called the *nasal*, springs from the upper margin of the alæ nasi, encircles the angle of the mouth, and is there joined by another line called *genal*, which springs from the malar bone; this line indicates disorder of some of the abdominal viscera.

In acute affections of the brain or meninges, the face is generally flushed, turgid, and hot, or the colour is intermittent—the redness being fugitive and followed by pallor; the eyes are vacant or staring, and often a good deal suffused, sometimes the upper eyelid cannot be voluntarily raised, and the eye is half open, or there may be strabismus; in the early stage the pupil is contracted, but becomes dilated as the disease advances; in the later stages, owing to the rapid emaciation, the eyes become deeply sunken in their sockets; the upper lip is drawn firmly over the gums, and is of a livid hue; and, at times, there are convulsions of all the features. The deformity produced by chronic hydrocephalus can hardly be mistaken, the disproportion between the size of the cranium and face, with the raised and bulging forehead, at once attracting attention. Similar changes to those mentioned above in regard to the eyes sometimes occur from intestinal irritation, as from worms, &c.

Diseases of the organs of respiration, as laryngitis, bronchitis, or pneumonia, produce a dusky-red, swollen appearance of the features; wide dilatation of the nostrils during each inspiration, and strong contraction with each expiration; knitting of the eyebrows; and lividity of the lips, which, moreover, are widely opened to facilitate respiration if the breathing be much oppressed. Should the disease assume a chronic form, the features will become emaciated, and present an appearance of decrepitude.

The expression of countenance produced by disorders of the abdomen is very characteristic; it being difficult to mistake the cause of the peculiar peevish or fretful look, sharp pinched features, sunken eyes, pallor, and dark colour of the lips and skin surrounding the mouth. In severe forms of gastro-intestinal inflammation, the face rapidly becomes sallow and emaciated; the lips are stretched firmly over the gums, and are pale, dry, and cracked; the chin seems to project unusually; and the nose looks swollen. In chronic irritation of the bowels from worms, the nose and upper lip are often tumid, the conjunctiva is said to look pearl-like, the skin assumes a dusky, muddy appearance, and the pupils are often a good deal dilated, it is said by a kind of reflex paralysis. In weakness and exhaustion from diarrhœa, or from loss of blood, &c., the face is alternately flushed in patches and pale, hot and cold: while, in very extreme cases, the cheeks are pallid, cold, and glistening; the eyelids half closed; the corneæ covered with films of mucus; and the pupils contracted.

The form of the face differs much in certain constitutional disorders: thus, in tuberculous subjects it is oval, thin, with a clear complexion, bright eyes, long and fine hair and eyelashes; in scrofulous subjects the face is rather rounded, fat, complexion muddy, skin thick, lips and alæ of nose pouting; in rickets the face is small, but broad, the forehead square, the eyes dull and languid looking, complexion pasty, skin thick and sometimes hairy.

It only remains to remark that the countenance is of a yellow hue in icterus or jaundice; livid, when the blood is improperly aerated; and of a deep blue or purple in morbus cæruleus, in which affection a malformation of the heart allows of an admixture of the venous with the arterial blood. The lachrymation, redness of the eyes, and swelling of the eyelids, which precede the eruption of measles, will not be forgotten by one who has witnessed these premonitory symptoms; and the same statement applies to the brilliancy of the iris and extreme contraction of the pupil in a child who has taken an over-dose of opium.

The Gestures and Attitude.—In children old enough to be playful and easily amused when awake, the commencement of disease is frequently signalized by their ceasing to be attracted by surrounding objects, by their listlessness and dislike of any movement, by their generally saddened expression, and their dislike apparently to take the trouble even to smile. As indisposition creeps on, the child begins to give evidence of its uneasiness by frequent startings and general restlessness, especially in its sleep: if it has begun to support itself—to hold up its head—it perhaps ceases to do so, at the same time it begins to assume the posture and movements of extreme languor; all this clearly indicates that muscular debility which so commonly precedes an attack of acute disease. If a child has arrived at the age of fifteen or eighteen months without being able to hold itself upright, we shall probably find it suffering from rachitis, which will be indicated also by deformity of the thorax, curvature of the spine, weakness and bowing of the lower extremities, and other external characters, which will be afterwards enumerated. The pain of inflammatory affections often causes the child to avoid all movement, and, in inflammation of any part of a limb, all motion of the affected member. In severe abdominal irritation or inflammation, the child lies with the knees bent and drawn upwards, rolling about, however, and uttering loud cries on the sudden accession of pain. An acute spasmodic pain induces immediate contraction of the whole of the muscles, the infant starting in terror and surprise. In convulsions the head is drawn backwards, one or both arms become rigid, and the legs are drawn upwards or violently extended: at the same time, the breathing may be spasmodically affected, hurried and irregular, the thumbs and fingers may be drawn into the palms of the hands, while the toes are firmly flexed. Sometimes only one set of muscles is affected, or one side of the body only is convulsed. The eyes are generally fixed, or roll about, and are insensible to light and even to touch. In great prostration from any cause the child lies motionless, or one side of its body may be paralyzed.

There are some few gestures which point at once to the seat of the disease: "as the tongue speaketh to the ear, so the gesture speaketh to the eye." Thus, in inflammation of the brain or its membranes, the hand is frequently raised to the head, attempts are made to tear off the cap, and a quick movement, as of striking the air, is performed, while the head is rolled from side to side as it lies on the pillow. In disorders of the tongue or fauces, and during dentition, the child presses its fingers into the mouth, or seizes the mother's nipple roughly and greedily, or rubs the gums with anything it can get hold of within its reach. In croup and other diseases producing difficulty of breathing, it pulls at its larynx, tries to compress it laterally, and by its urgent cries indicates the seat of suffering and pain. Sometimes all this is relieved when the child is placed in an erect position. Lastly, there are the convulsive movements of the muscles of the face so common during dentition, or when any irritation of the digestive canal exists: and the involuntary and tumultuous movements which betray chorea in the more advanced child. These latter, however, need no description.

The Sleep of a healthy child is tranquil, deep, and prolonged, its countenance at the time being calm and quiet, a smile sometimes passing over it; its breathing is slow and occasionally interrupted by deep inspirations or sighs, and its limbs are relaxed; on awaking it is lively, and seeks the breast. In disease, on the contrary, the rest is disturbed and broken, the respiration may be loud and laboured, the brow contracted or the mouth drawn, there is grinding of the teeth or gums, sudden startings occur, and the child awakes either fretful and peevish, or—if frightened—to cry and scream.

For the first few weeks after birth infants pass much of their time in sleep, during which the skin is moist and the digestion energetic. As the system is slightly enfeebled during sleep, and the power of maintaining the animal heat lessened, care should be taken to shield them from draughts, cold, &c. Any irritation in the bowels or brain, or any slight degree of uneasiness or pain, will prevent sleep or make the child fretful and disturbed: during convalescence from acute disorders there is also very frequently troublesome sleeplessness. On the other hand, somnolency is often produced by overloading the stomach, by serious cerebral disease, and sometimes by dentition. A strong indication of a tendency to convulsive disorders is evidenced by a rigid extension of the limbs, with a turning inwards of the great toes and thumbs during sleep.

The Cry.—Often the first indication which an infant gives of life is to cry, and the more loudly and freely it does so the better; since it proves that the most important of the vital organs are well formed, and that the child is not deficient in health and vigour. After the first few hours of existence, however, the properly-nursed healthy infant cries but little; the act of crying being, as it were, reserved to express pain, distress, or hunger. Violent paroxysms of crying are generally produced by great pain; and when prolonged become injurious, causing congestion of the brain, and sometimes convulsions. In affections of the lungs—especially pneumonia—the cry is said to be laboured, or smothered—*i.e.*, it is rather a groan than a cry: in croup it is hoarse and muffled, and attended by a peculiar ringing sound, or crowing inspiration: in œdematous angina—according to Billard—it is tremulous. In acute cerebral diseases there is sometimes a single, sharp, powerful cry, occurring at rather distant intervals, which has been termed by the French the *cri hydrencéphalic.* Lastly, in the majority of diseases of the stomach and intestinal tube, the cry is prolonged and acute; or low and moaning, if much exhaustion has been produced.

In young children, the cries are often accompanied by an abundant secretion of tears, but this is not the case with infants until about the third or fourth month; since the functions of the lachrymal gland are not brought into play until this time. Hence, when no tears are shed, we must consider whether this be due to the age of the little patient or to the functions of the lachrymal gland having been suspended by acute disease. M. Trousseau believed that in acute disease in children, no matter how severe the symptoms were, if tears were shed, the prognosis would be favourable, while on the other hand, if no tears were shed, and especially if the eyes were sunken, then the prognosis would be unfavourable. The younger the children the more certainly was this rule observed.

The Mouth and Breath.—In health, the mouth is moist and pale, the tongue smooth and partially covered with a layer of whitish mucus, the gums red, and the breath free from smell or having only the odour of the mother's milk.

These conditions are altered by slight causes: the mouth may become hot, red, and dry; the tongue loaded with a white, curdy matter; and the breath hot, sour, or acid. This is especially the case in fevers, in acute affections of any of the important viscera, in diseases of the alimentary canal, and in painful dentition.

In severe cases of small-pox, scarlatina, measles, laryngitis, and croup, the tongue often swells, and becomes covered with a dark brown fur. In scarlatina, the tongue is loaded with a thick white fur, through which enlarged and prominent papillæ project; but, as the fur clears away, it becomes clean and preternaturally red, and of a strawberry appearance. Aphthæ of the mouth, throat, and tongue, are common in infants; they may be due to improper food, to impure air, to the irritation of dentition, or to more serious causes. The breath may be rendered fœtid by attacks of fever and by indigestion; it becomes positively foul in gangrene of the cheek or lungs, or in severe ulcerations about the nose or throat.

The Skin in the healthy infant should be firm, elastic, and smooth, of a rosy flesh colour—neither too red nor too pale—moist and warm, and uniformly distended by soft subcutaneous areolar tissue and fat. Whenever it becomes hot and dry, or pale and flabby, or yellow or intensely red, we may be sure all is not right: moreover, the slightest eruption should attract attention, and, if it be contagious, the parents should be warned.

A hot, harsh, dry skin is common to all febrile and acute diseases; a cold, moist one to constitutional feebleness, or to sclerema, or to disorders producing great prostration: increased redness is an indication of inflammation, or warns us to look for one of the eruptive fevers: a pale, doughy, or puffy condition, with emaciation, bids us take defensive measures against scrofula and tuberculosis: intense blueness may arise from any cause interfering with the oxygenation of the blood, or from cyanosis: yellowness from some affection of the liver: a dirty, sallow hue may be produced by diarrhœa, or any protracted disease of the abdominal viscera: and a tawny muddy coloured skin is indicative of syphilitic taint.

The "tache meningitique, ou tache cerebrale," has been pointed out by M. Trousseau as a red mark or stain, easily produced by pressure upon the skin of children suffering from tubercular meningitis. This mark is most readily made upon the face, neck, or chest; and, though most common in cases of this kind, it has also been observed in congestion of the brain, in pneumonia, &c. Dr. Baines suggests that it is due to some altered relation between the supply of nervous power to the capillaries and the circulation, allowing of a ready dilatation of the superficial vessels when any irritation is applied to the skin.

The Abdomen is relatively larger in the infant than in the adult, from the greater proportional development of the abdominal viscera. Its walls are distended in tympanitis, ascites, tabes mesenterica, hypertrophy of the liver, &c.: they are retracted or depressed in cerebral affections, meningitis, and progressive marasmus. In ascites it is best to practise palpation and percussion while the child is erect, otherwise the fluid may gravitate to the dependent parts, allowing the intestines to come into contact with the anterior abdominal walls. The anal region should be examined: cases of slight spasmodic diarrhœa may be thus differentiated from entero-colitis by the absence of a characteristic erythema.

The Temperature of the body is a valuable aid in the diagnosis of disease, but to be of any avail the rough-and-ready method of estimating it by the hand alone will not suffice. For this purpose properly constructed thermometers are necessary, and they are fortunately now available in a very cheap and portable form. The information they afford is often of the utmost value and importance, and no careful observer will be content to treat severe cases of acute disease without using this means of investigation. For all purposes the axilla is probably the best position in which to place the instrument, and it should be allowed to remain there for at least five or six minutes. It appears, however, from Dr. Baumler's investigations, that the length of time necessary for an observation varies according to the locality tested: thus, if the thermometer be placed in the rectum, from three to six minutes will be required; if in the mouth, from nine to ten or twelve minutes; and, if in the axilla, from eleven to twenty-four minutes. The registering form of thermometer is the best to use.

In children, the average temperature in health is about 99·5, and according to recent observations it appears that a temperature of 102° in the upward direction, or of 97·5 in the downward, is a sure sign of mischief, and any excess in either direction may *cæteris paribus* be taken as a fair test and standard of the morbid action: probably the indications it affords are more really trustworthy than those derived from the pulse. According to our experience, an increase to 102° or 103° signifies only a moderate degree of febrile disturbance; a constant rise to 105° implies severe disorder; 106° to 107° denotes danger, and 109° or 110° is indicative of extreme danger.

The observation of the temperature is of the greatest value in cases of continued fever, in the eruptive fevers, in pneumonia, rheumatic fever, tuberculosis, &c. And in regard to prognosis we may observe, that a persistent fall in the temperature is at all times most favourable, but especially so if it be towards evening; always supposing that other symptoms are not more grave, but the reverse. If the temperature falls while the pulse rises, and other symptoms are aggravated, the patient is losing ground, probably from exhaustion, and stimulants are required. Death is always preceded by a fall in the temperature. It is supposed that an increase of one degree in the temperature above 100° is equal to a rise of ten beats of the pulse per minute. According to M. Roger, pneumonia and typhus fever are the diseases attended with the greatest rise of temperature. Thus, if the pulse and respiration be quickened, and the temperature raised to 104°, inflammation of the lungs may be diagnosed; while the same degree of heat, with a moderate pulse, is peculiar to typhus. According to Wunderlich, in favourable cases of typhoid fever the rise in temperature during the first and second weeks is very gradual, and is always highest in the evening; if the rise be rapid and high in the first week, or if the temperature varies much, it is a bad sign. In peritonitis or enteritis the temperature is said seldom to reach 104°.

Rigors do not occur in young children, even when suffering from intermittent fevers. M. Bouchut states that he has observed the commencement of an attack of intermittent fever in several children under two years of age, and not one experienced shivering; the cold stage being only outwardly betrayed by a considerable paleness of the face, by decoloration of the lips, and by a manifest bluish tint beneath the nails.

The Respiration.—The new-born infant breathes instinctively, without method or regularity: when about two years of age the respirations become more regular. The younger the child, the less the chest dilates during inspiration, and the more freely do the muscles of the abdominal wall and the diaphragm act; hence the respiration is said to be abdominal. The respiration is most tranquil during sleep, is repeated about thirty times a minute, and the movements of inspiration and expiration succeed each other without effort. On awaking the breathing is altered; for a time being calm and easy, then intermittent and hurried, and again free and tranquil.

The average frequency of the respiration in early infancy is about 39 inspirations in a minute, but it may rise from merely transient excitement to 80; as age advances the frequency diminishes somewhat, but seldom falls below 30 during childhood.

The chests of children at the breast are but slightly resonant on percussion ; and on auscultation, the respiratory bruit is heard, faint and feeble, owing probably to the incomplete dilatation of the air-cells. After this period, as the rarefaction of the pulmonary tissue becomes greater, the resonance increases; while the respiratory murmur becomes sonorous and roaring—puerile respiration.

All diseases of the glottis, larynx, and trachea are attended with difficult and noisy respiration ; they are also accompanied with cough, which is hoarse and spasmodic in inflammation of the glottis, ringing in laryngitis, and crowing in croup.

In bronchitis, pleurisy, and commencing pneumonia, the breathing is merely hurried, the cough hacking and dry, and unaccompanied with expectoration: as the severity of the inflammation increases, however, the rapidity of the breathing becomes augmented, so that, in confirmed pneumonia, the respiration may be termed *panting*, from sixty to eighty inspirations being made in the minute. At the same time there is rapid dilatation and contraction of the nostrils, violent moist cough, and copious secretion ; the matter secreted is, however, generally swallowed, so that we are unable to aid the diagnosis by its examination. When the pain in pleurisy is acute the respiration has the peculiar character of being *restrained* —*i.e.*, it is suddenly stopped at each effort by a kind of convulsive spasm. In peritonitis, also, the inspirations are short, jerking, and difficult, owing to the pain caused by the movement of the abdominal muscles.

In some cerebral diseases the respiration is sometimes irregular, short and jerking, at other times sighing ; the effect being as though the respiratory muscles were subject to a kind of convulsive action.

The Circulation.—Authors who have paid attention to the frequency of the pulse in children at the breast have not all arrived at the same conclusions. Thus, Haller, fixes the number of beats at 140 a minute; Sœmmering, at 130 or 140 the first year, 120 the second, and 110 the third ; Billard observed a minimum of 80, and a maximum of 180, in thirty-nine infants from one to ten days old ; while M. Trousseau found a minimum of 96, and a maximum of 152, in children of from fifteen to thirty days.

From a careful examination, however, of much that has been written upon this subject, and from our own experiences, we believe we are justified in making the following observations:—

1. In young infants, no signs can be deduced from the fulness or hardness, the strength or weakness, of the pulse, since generally these distinctions cannot even be recognized.
2. The pulsations are often irregular, without any disease being present.
3. They are very frequent, the normal quickness varying from 100 to 120 a minute ; the average frequency being about 104 for children under five years of age.

4. They diminish gradually as the period of weaning approaches, continuing to do so until adult age, when they are about 80.
5. Sex has no influence up to the age of seven years, after that the female pulse becomes slightly quicker than that of the male.
6. Sleep lowers the frequency by about eighteen or twenty beats per minute, and makes it also more regular.

In estimating the value of the indications derived from the pulse it must be remembered that the heart's action is more variable in infancy than at any other period of existence, and that moral impressions quicken the pulsations as much as fever or inflammatory disease.

There are some peculiarities of the pulse which undoubtedly possess a diagnostic value in certain diseases. Thus, in acute hydrocephalus it is characterized by irregularity of rhythm, with occasional intermissions; it may vary in a short time from 80 to 150. In pulmonary inflammations the pulse respiration ratio is disturbed, the breathing being quicker in proportion than the pulse, for instead of the former being as 1 to 3 of the latter, it may be as 1 to 2, or even as 1 to 1. A rapid pulse is indicative of fever only when there is also increased temperature.

Discharges by Vomit and Stool.—Infants frequently vomit from mere repletion, a greater quantity of milk having been sucked than the stomach can digest. In such cases the milk is brought up unchanged, or partly coagulated.

Any disturbance of the process of digestion will induce sickness. Repeated vomiting, however, shows that the cause is more than temporary. It may be due to improper food, to indigestion, to disease of the stomach or intestines, or to disease of the brain. The vomiting in the latter is often very peculiar and noteworthy; it is sometimes one of the earliest symptoms; is altogether irrespective of food being taken, often very persistent, and, when apparently causeless, should always excite suspicion in children of three or four years of age and upwards, especially when of an intractable character. Some of the eruptive fevers—particularly scarlatina—are ushered in by vomiting; so is infantile diarrhœa or cholera. Very often inflammation of the lungs or pleura begins in the same way. The paroxysms of hooping-cough are frequently terminated by a fit of vomiting. As children usually swallow matters secreted from the bronchial tubes, they are often again ejected with the contents of the stomach.

During the whole period of infancy and childhood the evacuations from the bowels are more frequent than in after-life. Diarrhœa, moreover, is readily induced by any excess in the quantity, or any fault in the quality, of the food, or by any irritation or inflammation of the alimentary canal, or by the irritation of dentition.

The first stools after birth—called the meconium—are of a dark-green or black colour, very viscid, and have an odour resembling that of the perspiration. Subsequently the evacuations become of a light-brown or yellow hue, of a curdy consistence, and free from odour. Frothy, acid motions, of a pale-green colour, indicate some disturbance of digestion; discharges of slimy mucus are common during dentition, or when worms are present in the intestines; thin fœtid dark-brown stools signalize chronic diarrhœa; and lastly, a dark-green colour of the discharges generally indicates serious disease of the stomach or intestines.

Constipation is not common in infancy. It may arise from the quality of the mother's milk, or from the food administered, from the exhibition of soothing syrups containing opium, or from some derangement of the liver preventing the free secretion of bile.

The Urine.—The examination of the renal secretion affords but little information in the diagnosis of the disorders of early life, moreover, it is obtained with such difficulty that nurses are seldom able to procure a specimen. Still, it is necessary to mention that, in all febrile affections, it is scanty, high-coloured, of high specific gravity, usually very acid, and often deposits a sediment: in intestinal irritation from worms, &c., and in cerebral disturbance, it is white and thick, and sometimes loaded with phosphates; in indigestion, and during dentition, it may be pale, limpid, and abundant; while after scarlatina—on the supervention of acute desquamative nephritis—it will become scanty, of a dark smoky colour, and be loaded with albumen when tested by being heated to the boiling point with the addition of a few drops of strong nitric acid; under the microscope it will be found to contain a good many blood globules, epithelial cells, and tube casts.

CHAPTER VIII.

INFANTILE THERAPEUTICS.

THE great aim and object of the physician being the relief of pain and suffering and the cure of disease, too much attention can hardly be paid to the nature and properties of the various agents with which he has to work. To form a correct estimate of the therapeutical value of many medicines, is, however, by no means an easy task; since, in addition to the well-known fact that several worthless articles still encumber our materia medica, it is also undeniable that well-founded doubts are beginning to be entertained concerning the value of certain drugs which for many years have been deemed absolutely necessary for the relief of particular morbid conditions.

Owing to this want of correct knowledge as to the properties and *modus operandi* of particular medicines, as well as on account of the extreme susceptibility of the young to many drugs, we should not only exercise great caution in prescribing, but ought also to watch closely the results produced. The following rules may be advantageously borne in mind:—1. That many of the diseases of early life may be arrested by very simple treatment, if promptly applied. 2. That drugs are sometimes unnecessary, where articles of diet can be made to serve as medicines. 3. That a marked disposition exists in infants and children to be easily affected by some medicines, especially those which exert their influence on the nervous system, such as narcotics and stimulants. 4. Those remedies only should be employed, the composition and modes of action of which are best known; while of those which are suitable, the least irritating and the most simple should be chosen. 5. We should try to make the dose as small and as palatable as possible, not only from motives of kindness, but especially because the forcible administration of nauseous physic to the young often does harm.

There is no department in the whole range of medical practice in which the want of some fixed and definite principle to guide us in the treatment of disease is more often or more seriously felt than in the diseases of early life. We do not mean those diseases only which are peculiar to early life, but would include nearly, if not quite, all the morbid processes occuring in childhood, and especially those of an acute character. Every one probably feels, when he is about to prescribe for a little child, that there is something which entitles him to special consideration, apart altogether from the mere question of dose; certainly no one who has attended largely to children's diseases but will have experienced this, and yet, perhaps, few would be able, if called upon, to give an explicit answer to the question, "What is this something?" We furbish up arguments from the physiology of childhood, and we catch therein a glimpse of the truth which still lies hid from our mental vision; we recognize the difference between the perfectly (anatomically speaking) and the as yet imperfectly developed body, and we see here some necessity for care in the use of remedies which are often as powerful for evil as for good. We note that some organs are more matured than others; and these may probably have an important bearing on the points at issue, for they may either be themselves the seat of disease, or they are those by which we hope to influence the progress of the malady. Then, too, we feel bound to take into account the very important influence which the nervous system of a little child plays not only in the physiology, but still more in the pathology, of early life.

But no one nor all of these considerations, important though they be, can be relied upon as a sound or safe guide in the difficulties which beset our path. They are good only in so far as they point to the one great leading fact in the phenomena of all the diseases of early life—namely, their *natural or clinical history*. This should be the physician's first study, and, just in proportion as he is enabled to unravel this, will be his success in therapeutics.

In treating the diseases of adult life our chief anxiety is to get the patient well, and our best chance of doing so is by following as closely as possible the path which nature points out as the one she intends to take; but in early life there is, or ought to be, a wholesome dread of something else: and herein lies the great difference between the therapeutics of early and of adult life.

A large proportion of the deaths which occur in early life, especially in acute diseases, are due mainly to some diathetic influence. There are no doubt cases in which acute inflammation of some vital part speedily cuts short life in those previously healthy, but interference with the natural progress of the disease by constitutional peculiarity (*i.e.* diathesis) is one of the great causes of death in childhood.

What then are these constitutional peculiarities (diatheses)? how are they produced? and what control can we exert over their development?

The diatheses, or constitutional peculiarities met with in children are the tubercular, the strumous, the rickety, and the syphilitic. So distinct are these in their physiological characteristics and pathological tendencies, that they seldom co-exist in the same individual. For instance, the tubercular and the strumous we never yet saw associated; and it is exceedingly rare to find, indeed we are not sure that we have yet seen, a clear case of rickets associated with tuberculosis. We have seen very often the syphilitic in concert with either of the other three, though it is much more common with the strumous than with either of the others, while the rickety and the strumous seem also to bear a not very distant relationship; still we repeat it is far more common to meet with them one and all separately.

How are these diatheses produced? This question may be answered in very few words. We are not now considering hereditary influence, but *acquired* peculiarities and the probability of their production by the mode of treatment adopted in any given case. Now there is one condition which is the great originator of all these diatheses (save and except the specific one of syphilis), namely, *debility*. No one ever saw a diathesis produced or developed in a strong and healthy child; perhaps, we might add with equal certainty that no one ever saw a diathesis developed in a child that was not weak and delicate, and, whatever else may weaken a child, acute disease will most assuredly do so; and this to a degree far greater in proportion than happens in the case of adults; we cannot wonder that it is so, when we remember the exceeding delicacy of its little organs, the exquisite sensitiveness of its nervous system, and the activity of all its physiological processes.

If, then, debility be the great progenitor of diathesis, and acute disease a certain cause of weakness, the answer to the question—What control can we exert over their development?—will supply the principle which ought to be our guide in the therapeutics of children's diseases, especially those of an acute character. This answer undoubtedly is—to do nothing which shall lower vital power, but all we can to sustain it.

This then is the principle which we recommend as the basis of infantile therapeutics.

Bearing this in mind the practitioner must pay due regard to the mode of accession, supposed cause, and duration of the symptoms; to the general aspect, nutrition, vital power, and constitution of the little patient; to the conditions—air, temperature, &c.—by which the child is surrounded; and the nature of the diseases prevalent at the time. Moreover, while subsequently watching the progress of the disorder, he should be careful not to attribute too much of the improvement to the action of the remedy; for it may be due to the *vis medicatrix naturæ.*

No rule that will be applicable under all circumstances can be laid down as to the exact *dose* of a medicine which a child will require, compared with an adult. Still, although the proportion cannot be stated with arithmetical precision, we can form some general opinion on the subject, and the following table, though not to be implicitly followed, may serve as a valuable guide. We have put the symbols for fluid measure in the first column of doses, those for solids in the other two, but all these can be readily reversed by substituting grains for minims, and *vice versâ:*—

Age.	Maximum Dose for an Adult.		
	One Ounce.	60 Grains.	20 Grains.
1 Month . .	fl. drm. ½	grs. 3	gr. 1
3 „ . .	fl. drm. ½	4	1
6 „ . .	min. 40	6	2
9 „ . .	min. 40	7	2
1 Year . .	fl. drm. 1	8	3
2 „ . .	fl. drs. 1½	10	4
3 „ . .	fl. drs. 1½	12	4
4 „ . .	fl. drs. 2	15	5
5 „ . .	fl. drs. 2½	18	6
6 „ . .	fl. drs. 3	20	7
7 „ . .	fl. drs. 3½	25	8
8 „ . .	fl. oz. ½	30	10
10 „ . .	fl. drs. 4½	35	12
12 „ . .	fl. drs. 5	40	14
13 „ . .	fl. drs. 5½	40	15
15 „ . .	fl. drs. 6	45	16

It may not be out of place here, and certainly it is not an unimportant question—especially in the therapeutics of childhood—to consider some few rules which should guide us in our method of prescribing, so as to make our prescriptions as efficacious and agreeable as possible. Thus—

First, we may promote the action of the basis :—1. By combining several different forms or preparations of the same substance. 2. By combining the basis with substances which are of an analogous nature—*i.e.*, which are individually capable of producing the same, or kindred, effects, but with less energy than when in combination with each other. For example, krameria and logwood, ether and camphor, henbane and belladonna, rhubarb and colocynth, &c. 3. By combining the basis with substances of a different nature, and which do not exert any chemical influence upon it, but are found by experience, or inferred by analogy, to be capable of rendering the stomach or system more susceptible of its action. As examples, we may instance quassia with steel; tartar-emetic with sulphate of magnesia, ipecacuanha with antimony, &c.

Secondly, we may correct the operation of the basis, by obviating any unpleasant effect it might be likely to occasion, and which would prevent its intended action, and defeat the object of its exhibition, either—1. By chemically neutralizing or mechanically separating the offending ingredient. 2. By adding some substance calculated to guard the stomach, or system, against its deleterious effects. For example, henbane and podophyllin, cinnamon and aloes, soap and colocynth, &c.

Thirdly, we may, if occasion requires, obtain the joint operation of two or more medicines.—1. By uniting those medicines which are calculated to produce the same ultimate results, but by modes of operation totally different. Examples are seen in the actions of ipecacuanha and squills, digitalis and squills, catechu and chalk mixture, acid and bark, &c. 2. By combining medicines which have different powers, and which are required to obviate different symptoms, or to answer different indications. For example, myrrh and aloes, opium and logwood, sulphate of iron and sulphate of magnesia, &c.

Fourthly, we can obtain a new and active remedy, not afforded by any single substance.—1. By combining medicines which excite different actions in the stomach and system, in consequence of which new or modified results are produced. Examples are seen in the combination of opium and antimony, opium, nitrate of potash and ipecacuanha, gentian and senna, &c. 2. By combining substances which have the properties of acting chemically upon each other, and the results of which are, either the formation of new compounds, such for instance as lemon juice and carbonate of soda, acetic acid and ammonia, &c., or the decomposition of the original ingredient, and the development of their more active elements, as in adding spirit to dry aconite beans, citric acid to bicarbonate of potash, &c. 3. By combining substances between which no other change is produced than a diminution or increase in the solubility of the principles in which their medicinal virtues reside—as by the intervention of substances that act chemically, such as acetic acid and acetate of lead, sulphuric acid and sulphate of magnesia, acetic acid and acetate of morphia, &c.; or by the addition of ingredients whose operation is entirely mechanical. For example, mucilage and bismuth, yolk of egg and castor oil, sulphate of potash and scammony, &c.

Lastly, some thought should be given as to the most eligible form.—1. Either as regards its efficacy, as in administering peppermint water and carbonate of ammonia. 2. Or as regards its taste or appearance, as for example, orange peel and turpentine; ginger and liquor potassæ, syrup and sulphate of magnesia. 3. As regards its consistence or equable mixture, as when water is added to various mixtures; soap to mercury, &c. 4. and lastly, with reference to its preservation. Examples of this are seen in the addition of spirits (tinctures) to infusions, &c.

A child during its illness must be supported by *suitable nourishment*, given at short intervals. If an infant, and the breast milk is found too stimulating, it must be diluted with water, or exchanged for thin gruel, arrowroot, or barley-water. In disorders of a lowering nature, and in convalescence from acute affections, more nourishing food than usual may be wanted; and we have frequently seen the best results ensue from giving beef-tea, or the yolk of an egg beaten up in milk, or from a small quantity of port wine well diluted. *Diluents* and *refrigerants*, as water or slops containing a small quantity of nutriment, should be freely allowed in febrile disorders, and in most cases when the child eagerly desires cold drinks; they diminish the specific gravity of the blood, distend the blood corpuscles (Hewson), augment the secretion of the kidneys, and promote exhalation by the skin and lungs. When it is necessary to increase the specific gravity of the liquor sanguinis, we must withhold these fluids; and the same rule obtains in cases of diabetes, when it is desirable to repress excessive secretion; and in affections characterized by a watery condition of the blood (*spanæmia*), as anæmia, morbus Brightii, &c.

Climate.

Climate is undoubtedly of vast importance in the treatment of children's diseases, and no practitioner in the present day will expect to cure disease in a close, over-crowded, or ill-ventilated apartment, for he knows full well that that is an impossibility. Fresh cool air is both food and medicine; and we must take care that it is freely supplied to the sick child, whose room should seldom be heated beyond 65° Fah.

Independently, however, of a pure atmosphere; we have a valuable remedy in *change of air;* protracted cases of infantile disease being frequently benefited even by mere removal from one room to another. This is especially true in fevers, chest affections, and abdominal diseases; while in affections of the head the good to be derived is more doubtful, always supposing that the room already occupied is quiet, free from damp, and well ventilated.

One of the best remedies, perhaps, which we possess for diseases in which debility is the chief and fundamental character, is *sea-air*. This can hardly be wondered at when we compare the atmosphere of large towns with the pure invigorating air of the sea. Dr. Glover is of opinion that the latter, besides containing minute quantities of chlorine, bromine, and iodine, has also in its composition more oxygen and ozone than the air of inland districts. Scrofulous children who sometimes remain unbenefited by any of the drugs in the Pharmacopœia, improve surprisingly from a residence on the coast; and the same takes place in pale, irritable children, who without being positively ill, are always languid and pining.

In children between three and four years of age, and particularly between five and seven, threatened with hydrocephalus or mesenteric disease, or disposed to glandular enlargements, or to membranous inflammations—bronchitis, croup, gastric and intestinal irritation, &c.—Dr. Evanson recommends removal for the winter months to the genial climates of the *South of France* or *Italy*; having himself seen such children pass the whole winter in those countries without one day's illness, whereas previously they had seldom been out of the sick-room. "The places on the Continent best suited as winter residences for children are Nice or Rome, but in the commencement of the season, Naples is equally eligible; and for those with whom a soft, but rather moist, atmosphere is calculated to agree, Pau is a convenient place to select." For feeble, delicate, and strumous children, the dry, invigorating air of Nice is the best; for such as are liable to acute inflammatory attacks, or to bronchial affections of a dry irritating kind, or who have an excitable nervous system, the mild soft relaxing climate of Rome is to be preferred. In either case, a residence should be selected in a good quarter of the town, and the aspect of the rooms should be southerly.

Baths.

Baths are of great value in the treatment of children's diseases, and the warm bath may often be employed with advantage; it soothes irritation, subdues pain, lessens fever, promotes perspiration, and induces sleep. The water should not be very hot, 95° to 98° Fah. is a good temperature: about six gallons will be required for an infant, ten for a child three years old, and twenty for one of seven years. The child should remain in the bath, with the water up to the chin, from five to fifteen minutes, according to its age; and should be quickly and carefully dried on being taken out, and then put into a warm bed.

The diseases in which warm bathing is beneficial are infantile convulsions, combined with cold applications to the head, laryngismus stridulus, chronic cutaneous disorders, eruptive fevers in which the eruption is slow to come out or has receded, dropsy following scarlet fever, chronic inflammatory affections, infantile cholera, and some cases of continued fever. Immersion of the feet and legs in hot water, while ice or cold water is applied to the top of the head, often does good in inflammatory affections of the brain and its membranes, and in convulsions.

The warm bath often acts beneficially as a cooling agent, in fever, pneumonia, &c., when the temperature of the body is higher than that of the water employed. A moment's consideration shows that this must be the case; since, as water is a good conductor of heat, it follows, that if the bath has a temperature of 96° and the patient's body is of 104° or 106°, the latter must, on being immersed, rapidly part with heat to the former.

The effects of the *Vapour Bath* are very similar to those of the preceding, except, perhaps, that it is more derivative to the surface, more diaphoretic, more lowering, and less soothing. It may be employed in chronic scaly cutaneous affections; in rheumatism; and especially in that fatal disease of new-born children—sclerema, or induration of the skin and areolar tissue. In the latter case it must be promptly resorted to; and its application should be repeated every six or eight hours, until the skin becomes moist and soft, and until the tightness and hardness have disappeared. It is also especially useful in inducing diaphoresis in cases of renal dropsy after scarlet-fever, being probably one of the most powerful remedies of this class which we possess, but its debilitating influence must always be borne in mind. The heat of the vapour should be between 98° and 100°, and not above 105°.

Medicated Baths consist of water impregnated with various substances, and are valuable and powerful therapeutic agents. In using them care must be taken that none of the water gets into the child's eyes, as severe irritation would often be caused.—The *warm artificial salt-water bath* is a useful means of stimulating the functions of the skin, and imparting tone and vigour to the system: hence it is followed in glandular enlargements, in the strumous diathesis where the cutaneous circulation is languid, and in some chronic skin diseases. *Alkaline* baths stimulate the skin, promote the functions of absorption and secretion, and relieve spasm and convulsion. For infants and young children they may be made by adding from a quarter to half a pound of soft soap to the water; but for children above six years of age, and in cases where we wish to make a more powerful impression on the nervous system, from half an ounce to six drachms of the carbonate of soda or potash, to each gallon of water will be required. *Sulphureous* baths—made by adding half a drachm of sulphuret of potassium to each gallon of water—are more powerfully stimulant and alterative than the preceding. Hence they are mostly used in obstinate skin diseases, as psoriasis and lepra; in scabies, when it is extensive; and in some nervous diseases, as chorea. In some forms of scrofula *Iodine* baths, repeated two or three times a week, are said to be valuable; they may be prepared in a wooden tub, by adding from eight to ten grains of iodine, and twenty to thirty grains of iodide of potassium—according to the age—to each gallon of water. Lastly, *Ferruginous* baths may be employed in children of a relaxed frame, where the internal use of tonics is objectionable. They can be promptly prepared by the addition of half an ounce of the tincture of the sesquichloride of iron, or two drachms of sulphate of iron, to every ten gallons of water.

The *Cold Bath* is a powerful stimulant and tonic of great efficacy, when judiciously used. It is indicated in delicate and strumous children, where there is weakness and languid absorption, without much irritability of the nervous system; and in the latter stages of convalescence from acute affections. No form of it is more efficacious than *sea-bathing*, especially when used in the middle of the day, during the summer months. We must, however, be careful not to prescribe it rashly, since it is far too stimulating a remedy for infants, as well as for children prostrated by disease. Moreover, when it is ordered directions should be given to discontinue it, if it gives rise to much alarm, and unless a proper reaction—indicated by an agreeable feeling of warmth and refreshment—follows its use; only harm can result if the child remains cold and shivering, fatigued and prostrated, heavy and oppressed, for some time afterwards. Where, from any cause, bathing in the open sea is inapplicable, the use of the *shower-bath* will be found attended with many advantages, especially in children subject to nervous or convulsive affections. Only a small hand-bath, such as is made purposely for children, or a very large sponge, need be used; the water, at first, must be tepid, and the body should be afterwards well rubbed with a piece of flannel, or a coarse towel.

Cold sponging is a convenient and grateful method of moderating the excessive heat of simple fever, and of some other febrile or inflammatory conditions. The *Shallow* bath is a most valuable means of reducing fever in children, when the heat of the body is above the normal standard—*i.e.*, above 98° or 99° Fah.—and when it is not contra-indicated by any visceral inflammation, or by the presence of general perspiration, or by too great irritability of the nervous system.

The bath should be about six feet long, with a depth of water from five to twelve inches. The temperature of the water should vary from 60° to 80° Fah. In this the patient is to be placed in a sitting position, with the lower extremities covered by the water. They are to be constantly rubbed by an assistant, while water from the bath is poured gently over the head and trunk from a pitcher. This operation is to be occasionally interrupted, and the trunk is to be well rubbed by the assistant, who wets his hands in the water of the bath. The patient is to be kept in the water a variable time, until he is sufficiently cooled, which must be decided by the physician according to his appearance during the bath.

The *cold affusion* is too powerful a remedy—as a general rule—for children. Still many German physicians, as Heim, Harder, and others, have attested its utility in the exanthemata, in typhus, in spasmodic croup, and in acute hydrocephalus, when other measures have failed. To practise it, the child is kept naked in an empty bath or tub, while a pailful of water, at 40° or 50° Fah., is poured in a stream over the head and chest, from a height of one or two feet.

Blisters.

Blisters are substances which, when applied to the skin, irritate it, and occasion a serous secretion, raising the epidermis and inducing a vesicle. Various articles produce this effect, as cantharides—to which we generally refer in speaking of a blister—iodine, mustard, ammonia, turpentine, &c.

As to the value of these agents opinions differ very widely, for the old ideas of their action have recently been very severely, but not at all unfairly, criticized, and the result is that men have thought much upon the question, and have modified their opinions, and practice accordingly.

From these observations it must not be thought that we entirely condemn the practice of counter-irritation. On the contrary, in some chronic affections, in disorders which seem to be due to the suppression of an accustomed discharge, in diseases attended with effusion—after the subsidence of the acute symptoms, and in nervous pains—blisters, mustard cataplasms, or irritating ointments may do good.

Owing to the inflammation produced by blisters in the young, the emplastrum cantharidis should either be diluted with three times its weight of soap cerate, or, if used of the usual strength, the blister should not be suffered to remain on for more than two or three hours; and it will be advisable in all cases to further moderate the action, and prevent all chance of renal inflammation and vesical irritation, by interposing a piece of thin muslin or tissue-paper between the plaster and the skin. The blistered surface must subsequently be dressed with simple cerate freely spread on lint: or, if the sore be very irritable, with some soothing ointment, or with a warm bread-and-water poultice. Dr. D. Maclagan, of Scotland, after leaving the blister on for a suitable time, applies a poultice of bread and milk for two hours. After discharging the serum, a thick layer of soft cotton wadding is applied over the part, with the undressed or woolly surface next to the skin. If in the course of a few hours this should become soaked with the serous discharge from the blister, so much of the cotton may be removed as can be done without disturbing the loose epidermis beneath, and the whole again covered with a dry layer of cotton. The cotton is allowed to stick to the skin of the blistered part, and when a fresh layer of epidermis is formed, which takes place very readily, the old epidermis and cotton come off together, leaving a smooth whole surface below.

As a general rule we ought never to apply a blister to a child under five years of age, and even then it should only be allowed to remain sufficiently long to redden the skin, after which a linseed or bread poultice should be applied. Dr. Graves observes, "In treating the bronchitis of children, and in the bronchial affections of fever, I have frequently directed *the blister to be left unopened,* and I can state from experience that this plan answers very well." The dressing under these circumstances consists merely of a piece of lint and spermaceti ointment applied twice a day over the blister.

Where it is only wished to produce a mild effect, a sinapism made of equal parts of mustard and flour or linseed, applied for ten or twenty minutes, will be found to answer every purpose. It must not be forgotten, however, that when the skin is very delicate, even a sinapism will give rise to great general excitement, as well as to severe local irritation.

Depletion.

The abstraction of blood from the system acts in six principal ways:—1. It diminishes the quantity of blood in the system. 2. It impoverishes the blood by increasing its watery constituent, and diminishing its fibrin and globulin. 3. It weakens the heart's action. 4. It causes general debility, with mal-nutrition of the various viscera and tissues. 5. It drains blood from parts other than those whence it is taken. And 6. It promotes absorption.

The tolerance of blood-letting is admitted by all to be diminished in the very young, the old, and the feeble. We have only to consider its effects upon the very young; and, with regard to them, we may at once assert, as the results of our own experience and what we have witnessed in the practice of others, that not only do they bear bleeding badly, but that the abstraction of blood is very seldom necessary in the treatment of their diseases. Indeed, we believe that the only infantile diseases in which it is ever necessary to take away blood are those where an obstruction to the due circulation of that fluid exists—as in certain cardiac affections: and, in those instances, where much pain is caused by mischief resulting from mechanical injury.

It may be well, therefore, to make a few brief remarks on this subject, though, in subsequently speaking of each disease, we shall show clearly the plan of treatment which we are in the habit of adopting, and shall also often allude to that which we find recommended by other authorities.

First, then, we would say that no child should, under any circumstance, be bled without the most anxious reflection.

Secondly, should it be determined that blood must be taken, we are convinced that leeches will effect all that can be required. They should be applied over some part where pressure can be resorted to, and in the presence of the practitioner, who should not leave the house until the bleeding from the bites has ceased.

Thirdly, in deciding upon the quantity of blood to be removed, the practitioner must remember that all the strength which children may have at the commencement of an attack will be certainly required to carry them through it.

Fourthly, during the first six weeks of life, the loss of about one ounce of blood is *said* to be sufficient to relieve most inflammations; from six to twelve weeks, an ounce and a half or two ounces; from four to twelve months, three or four ounces; and subsequently, an additional ounce for each year of the child's age.

Fifthly, it may be estimated that each leech draws from four to six drachms of blood, including subsequent bleeding.

Lastly, we may add, that all authors agree that repetitions of bleeding are not borne well by children.

If all these points are borne in mind, we shall at least avoid doing much harm: whether or no by resorting to it we shall do good is a more doubtful matter. But it is probable that, in the reaction which has set in against all depletion in our day, we may be guilty of an opposite error, and be depriving ourselves of a remedy which, though unquestionably powerful for evil, is also capable of doing good.

We cannot doubt that good not unfrequently results from local depletion over the site of deep-seated inflammation. It is probable that both in this and in the case of counter-irritation the benefits are really due to some reflex action in the capillaries of the latter through the vaso-motor nerves; and this we believe is especially the case in children, in whom reflex action is so remarkably acute and sensitive.

Medicines.

In considering some of the more important medicines in use for the treatment of children's diseases, it might be thought that we should arrange these in some definite therapeutical order; it is, however, a subject for regret, that in the present confused state of therapeutics there is no system of classification which can lay claim to more than a very partial acceptance, and under these circumstances we do not feel that at present we can do more than make a few general observations on certain classes of drugs which may, it is hoped, serve as a guide for the practitioner in this special branch of medical practice.

Alteratives.

Alteratives and Resolvents or Deobstruents are medicines which promote secretion and exhalation generally, soften and loosen textures, check phlegmonous inflammation, lessen inflammatory effusions, and promote their re-absorption. They are opposed to the exudation of plastic or coagulable lymph—hence they check adhesive inflammation—and the formation of false membranes. During their use, visceral and glandular enlargements and indurations, thickening of membranes, and non-malignant morbid growths of various kinds, are sometimes observed to get smaller and softer, and ultimately to disappear. The chief agents of this class are mercurials, iodine and its combinations, antimonials, and alkalies.

The different preparations of *mercury* are extensively used in the diseases of children, and, when judiciously employed, with the best results. Even during infancy comparatively large doses of these agents are usually well borne; and it is remarkable that at this period of life, and up to the third or fourth year, salivation is never, or very rarely, produced. This circumstance, however, must only make us more cautious in prescribing any preparation of mercury: since, in consequence, we are deprived of a valuable criterion by which to judge of the effect of the remedy on the constitution; for it must not be thought that because mercury does not salivate an infant, therefore it does not affect the system.

The principal ill effects which sometimes result from the use of mercury are, violent purging and griping, profuse sweating, a disordered state of the digestive organs, with loss of appetite and wasting, a tendency to early decay of the teeth, a tremulous condition of the muscular system, eruptions on the skin—eczema mercuriale—and, after the fourth or fifth year, salivation. With regard to salivation, however, it must be remembered that this condition *may* be produced by a few other medicinal agents, as iodine, arsenic, antimony, nitric acid, and even opium, and also that it sometimes arises spontaneously. Gangrene of the mouth—cancrum oris—is a disease which is often mistaken for the effects of mercury; but although, in this distressing affection, there is a copious secretion of saliva, with ulceration or gangrene of the inside of the cheek, yet the morbid action is more circumscribed, and the gums, salivary glands, and tongue, are not all swollen and inflamed as they are from the first in mercurial ptyalism.

The chief value of mercurials is usually said to be obtained in inflammations of the serous membranes, as in meningitis, pericarditis, pleurisy, and peritonitis; in inflammations of the mucous membrane of the air-passages, especially croup; in iritis; synovitis; dysentery; chronic non-tuberculous consolidation of lung; tubercular peritonitis; congestive states of the liver, and mucous follicles of the intestines; and in syphilis, congenital or acquired. It must be confessed, however, that we are still ignorant of the exact value of this class of medicines in many of the foregoing disorders; and it is by no means improbable that, as our knowledge increases, we may find the employment of the various preparations of mercury greatly diminish. Mercurials are also administered in small doses as alteratives in certain chronic skin diseases, in some forms of dyspepsia, and in many cases to improve the secretions of the liver, pancreas, &c.; and in large doses as purgatives, though the practice of employing calomel and other mercurials as ordinary purges is bad. Their employment is generally contra-indicated in strumous children, and in cases where there is great irritability of the stomach or bowels.

Hydrargyrum cum Cretâ is a mild laxative and alterative. It is valuable in tubercular meningitis, in infantile syphilis, and in diseases due to—or accompanied by—faulty secretions.

Hydrargyri Subchloridum, or Calomel, is a preparation frequently employed in inflammatory affections when the full influence of mercury is desired. It may be advantageously combined with other remedies.—Vide Formulæ; *Alteratives.*

Unguentum Hydrargyri is most advantageously used when we wish thoroughly to affect the constitution, as in congenital syphilis, &c., or to destroy parasitic animals on the skin. Mercurial inunction may also be employed in cases where mercury in other forms is inadmissible. For a child one year old, 15 to 20 grains may be applied over—or gently rubbed into—the thighs, abdomen, or the axillæ, night and morning. To destroy parasitic insects, one application will commonly suffice.

Hydrargyri Perchloridum may sometimes be advantageously used in the diseases of childhood, especially in enlargement of the mesenteric glands and some forms of hydrocephalus. It may be given in combination with antimony and opium in lingering inflammations of a subacute character; or with the compound tincture of cinchona—notwithstanding that a slight chemical decomposition takes place—

in mesenteric affections attended with debility; or with tincture of rhubarb in constipation with deranged secretions.

The following table shows the strength of the various preparations of this metal:—

		Of Mercury.
Hydrargyrum cum Cretâ	contains	1 part in 3.
Pilula Hydrargyri	,,	1 ,, 3.
Linimentum Hydrargyri	,,	1 ,, 3.
Unguentum Hydrargyri	,,	1 oz. in 4½ oz.
		Of Calomel.
Pilula Hydrargyri Subchloridi Composita	,,	1 part in 5.
		Of Perchloride.
Liquor Hydrargyri Perchloridi	,,	gr. ½ in fl. oz. 1

As a remedial agent, Iodine is principally valuable for its resolvent influence in chronic visceral and glandular enlargements; in indurations and thickening of membranes, as of the periosteum; and in non-malignant morbid growths. It is especially indicated in scrofulous affections, in bronchocele, in diseases of the lungs and bronchial tubes simulating phthisis, and in the early stages of phthisis in combination with iron or other tonics. It is said to be contra-indicated in febrile and acute inflammatory complaints, in many of which mercury is thought to be more valuable, but the results which we have witnessed from the employment of the iodide of potassium in some of the severe inflammatory diseases of childhood—as croup and pneumonia—lead us to doubt the correctness of this restriction. Its long continued use sometimes produces troublesome sleeplessness, increased secretion from the mucous membrane of the eyes and nose and from the salivary glands, cough, emaciation, vomiting, purging, and chronic gastro-enteritis. When it disagrees, or when it has been given too largely, it should be discontinued; and its effects relieved by amylaceous diluents, sedatives and emollient enemata.

As a topical remedy—either alone, or conjoined with the internal administration—iodine is valuable in cutaneous scrofula, in rheumatism, in affections of the joints, in bronchocele or goître, and in some diseases of the skin, as lupus, psoriasis, impetigo, porrigo, &c.: it may also be employed simply as a counter-irritant. The tincture of iodine, or the stronger iodine-paint should be applied by means of a camel's-hair pencil, and repeated daily until the cuticle peels off; or either of the officinal ointments—the iodide of mercury, iodide of lead, or compound iodine, or the linimentum iodi—may be gently rubbed into the skin of the neck, abdomen, &c.

A great objection to the outward application of iodine, especially to parts which are exposed to view, is its discoloration of the skin. To obviate this, Dr. J. W. Ogle recommended the use of iodic acid, which has the advantage of being quite soluble in water, and of forming a colourless solution. One grain of iodic acid is supposed to be equal to about half a grain of iodine. It is to be used in conjunction with some stimulating liniment, and to be applied with friction. He also recommends very strongly the employment of iodate of iron, in place of the iodide, as being much more stable. It is soluble in water, and may be given in doses of from half a grain to three grains for children from two to seven years of age.

Iodine baths also have been extensively used by Lugol and others in the treatment of scrofula; but their efficacy is doubtful.

Iodine alone should never be administered to children: the most approved form, both for internal and external use, is in conjunction with iodide of potassium, forming what is called ioduretted iodide of potassium: or the iodide should be prescribed by itself in doses varying from gr. ¼ to gr. 1, thrice daily, its effects being analogous to those of iodine; or, where it is desirable to administer a tonic and alterative combined, as in many strumous affections of the glandular system, the iodide of iron may be ordered.—Vide Formulæ.

Cod-liver oil—obtained from the liver of several species of Gadus—has long been held in high estimation in Germany and Holland for the treatment of strumous and rheumatic affections. In the present day, it is everywhere employed, with more or less success, in a considerable number of diseases; those in which it is most valuable being phthisis, all forms of scrofula, and chronic rheumatism.

There are three varieties of this oil met with in commerce—viz., the pale, the light-brown, and the dark-brown. The pale oil is to be preferred to the darker kinds for children, since it is more easily digested, produces less nausea, and contains none of those products of decomposition found in the latter. All the varieties increase the solids of the blood, especially that portion estimated as blood globules: the fibrin is probably diminished.

In administering cod-liver oil to children, we may commence with half a teaspoonful twice daily, floating it on some pleasant-flavoured liquid, as diluted orange-wine, or the compound infusion of orange-peel, or merely on a little syrup acidulated with a few drops of lemon-juice. If desired, other medicines—as iron, quinine, iodine, &c.—may be combined with it; though in prescribing for children, this practice is usually open to objection. Lastly, where the oil is not well borne by the stomach, it may often be advantageously introduced into the system by free cutaneous inunction, or by resort to the use of enemata.

Diaphoretics.

Diaphoretics are medicines which promote the cutaneous exhalation. They are employed to restore the cutaneous secretion when this has been checked by cold; to promote subsidence of those diseases which naturally end by augmented cutaneous exhalation, as simple fever and the exanthemata; to produce determination to the skin in congestions of internal viscera; and to establish a substitute for other secretions when these are suppressed, as of the renal secretion in Bright's disease, &c. In the disorders of children, however, we do not resort to these remedies as frequently as in the diseases of adults: partly because they are uncertain in their action, especially in the case of children in whom perspiration is not very readily induced; and partly because warm water and vapour baths generally fulfil all that we could obtain from drugs.

The action of diaphoretics is much favoured by warm drinks, warm clothing, warm baths, especially foot baths, and stimulants in general. It is retarded by the opposite of all these, by purgatives and by diuretics.

Nitrate of Potash is a diaphoretic to which it is necessary here to allude.

In moderate doses it acts as a refrigerant, antiphlogistic, diaphoretic, and diuretic: hence it is used in febrile disorders, common catarrhs, sore throat, &c. Dr. Young states that it also acts as a stimulant to the bladder or its sphincter, and that—owing to this property—he has found it useful in incontinence of urine in children. Its protracted use disorders the functions of digestion and assimilation. It is best administered in solution, but it may be mixed with white sugar and taken as a sort of bon-bon.—Vide Formulæ; *Diaphoretics*.

Carbonate and acetate of ammonia, the alkaline citrates and acetates, are also very useful diaphoretics.

Emetics.

Infants vomit more freely and with less distress than adults; chiefly because their stomachs are more elongated, and more closely resemble the intestines in form, than they do in after-life. This wise provision not only enables the infant readily to get rid of the contents of the stomach, when a superfluity of food—or food of an improper kind—has been taken; but it is also, as it appears to us, a therapeutical indication of no small value. Hence, remedies of the class now to be considered are frequently prescribed apparently with great benefit.

Emetics are chiefly valuable when we wish to evacuate the stomach, or to promote secretion and excretion, or to depress the vascular and nervous systems. They also indirectly promote the secretions of the liver, the skin, and the bronchial mucous membrane, and they are of use sometimes in securing the expulsion of foreign bodies from the throat or air passages. They should not be employed when the stomach or any of the abdominal viscera are inflamed, or when the head is much affected, or when there is great debility, or in disease of the heart.

In the early stages of many acute diseases, emetics do great good, and are generally more valuable than purgatives. "Innumerable times," says Hufeland, "has a fever, ushered in by convulsions and other signs of disorder, been immediately cut short by an emetic." When the eruption fails to come out kindly in any of the exanthemata, an emetic does good. In hooping-cough, catarrh, and most bronchial affections, emetics do good in all stages: for in the early periods, they tend to promote the resolution of the inflammation by increasing the secretion from the affected parts; while subsequently, when there is oppressed respiration from a too copious secretion of mucus, a fit of vomiting gives almost instant relief by helping to clear the overloaded bronchial tubes of the viscid phlegm which obstructs them, as well as by emptying the stomach of the expectorations which the child has swallowed. We sometimes have seen great benefit from commencing the treatment of a case of cynanche tonsillaris or of pneumonia with an emetic. In the latter instance, however, these agents are of little or no value, unless employed quite at the onset of the attack. The exhibition of an emetic in croup may often be beneficial, since it will not only tend to equalize the circulation and promote perspiration, but will also often help to expel the false membrane exuded by the mucous membrane of the trachea. In hepatic derangements and some examples of dyspepsia, emetics do good by promoting the secretion and excretion of bile, gastric juice, &c. And lastly, in strumous and delicate children with poor appetites, a mild emetic will very generally serve to renew the tone of the stomach, at the same time that it imparts a stimulus to the whole system, and especially to the organs of secretion and excretion.

In the administration of an emetic, we should be careful not to give too large a dose at first, but to repeat it every fifteen or twenty minutes until free vomiting ensues; to assist its action by allowing the child to drink freely of tepid water, which may be sweetened; and to exhibit it, if possible, in the evening, since the sleep and perspiration which it induces, are less likely to be interfered with, than at other times of the day. As regards the emetic to be used, we have—

Ipecacuanha, which is decidedly the best; being safe, mild, very efficient, and much less depressing than tartar emetic. In addition to producing vomiting, it promotes expectoration, acts on the skin, and controls inordinate action of the bowels, it is, moreover, easily administered.

Tartarized Antimony, is more irritating and depressing than ipecacuanha; and though more powerful, is not so certain nor so speedy in its action as the sulphates of zinc or copper: at the same time the latter produce less nausea and depression, and little or no diaphoresis. Sydenham advises that antimonial emetics should not be given to children under eight years of age; and this useful caution should be borne in mind unless it is thought desirable to lower the system.

Squill, is sometimes a good stimulating emetic in the bronchial affections of children; especially if it be deemed desirable to produce a mild diuretic action, in addition to vomiting. The oxymel scillæ may be given in half-drachm doses, frequently repeated; or it may be combined with tartar emetic.—Vide Formulæ.

Sulphate of Zinc, is prompt in its action, and does not give rise to any exhaustion. It is useful when any deleterious agent has been taken, and it is merely desired to evacuate the contents of the stomach. From gr. 2 to gr. 10 may be given according to the age, dissolved in warm water, and repeated every ten minutes until vomiting is produced.

Enemata.

In administering an enema to a child, care must be taken to avoid giving pain or producing any mechanical injury. A syringe with an elastic pipe ought to be used: and the tube—well covered with lard—should be gently introduced with a slight inclination towards the left side. The quantity of fluid employed requires attention, since the intestine readily dilates, and if over distended soon loses its tone. For an infant at the breast, one ounce is the proper quantity; from one to five years, three or four ounces; and from five to ten or fifteen years, about six ounces. *Purgative enemata* are efficacious in constipation depending upon obstruction of the lower intestine, intussusception, &c.: or in cases where the rectum and lower intestines are loaded from an accumulation of fæces: or when we wish to dislodge ascarides from the rectum. *Emollient* or *Astringent enemata* should be employed in cases of diarrhœa, not depending upon any irritating matters in the intestines; and also when we wish to allay irritation of the bladder. Lastly, in some examples of constitutional disease, accompanied with great irritability of the stomach, *nutritive* enemata will serve to nourish the child, until the force of the malady is allayed.—Vide Formulæ.

Expectorants.

Expectorants are medicines which increase the secretion and promote the expulsion of mucus and other matters from the larynx, trachea, or bronchi. They are divided into two classes, topical and general; but, as the former are not available in the treatment of children's diseases, we have merely to consider the latter.

General expectorants are of two kinds—nauseating and relaxing, and stimulating. In the *first* division, we have ipecacuanha and tartar emetic, both well adapted to those acute and sub-acute cases in which excessive vascular excitement prevails: in the *second* class must be arranged—squill, senega, assafœtida, and probably the carbonate of ammonia, all of which are useful in chronic cases of catarrh, and in sub-acute bronchitis attended with spasm of the muscular fibres of the bronchi. The action of all expectorants is promoted by keeping the body moderately warm, by the free use of warm diluents, and by the previous operation of an emetic; while opiates, purgatives, and cold retard their effects, and lessen their power.

Ipecacuanha is the expectorant most frequently used for children. When the inflammatory symptoms run high it should be combined with tartar emetic, or with calomel; when the cough is violent, or the stomach very irritable, a minute quantity of opium may be given with it, to alloy the former, and to enable the latter to tolerate this expectorant.—Vide Formulæ.

Tartar Emetic is more active than the preceding, and is consequently often employed in acute cardiac or pulmonary inflammations—especially pneumonia—where the skin is dry and hot, the expectoration deficient, and the breathing hurried and difficult. As a rule, it is thought to be more efficient in inflammations of the mucous than of the serous membranes. Great prostration, or any intestinal irritation, forbid its use. When prescribed its effects must be watched. It may often be advantageously combined with calomel, opium, &c.—Vide Formulæ; *Expectorants*.

Squill is useful in sub-acute bronchitis, and in other affections attended with cough and viscid phlegm, but unaccompanied by fever. It is most efficacious combined with other remedies.—Vide Formulæ.

Senega is stimulant, expectorant, diaphoretic, and diuretic in small doses; emetic and purgative in large. It is most effective in the latter stages of bronchial or pulmonary inflammation, especially when combined with ammonia and squill; also in chronic catarrh, in the second stage of croup, and in some forms of dropsy.—Vide Formulæ.

Assafœtida—a gummy-resinous exudation—is a very excellent stimulant, expectorant, and antispasmodic; of a very offensive odour —hence called by the Germans *Teufelsdreck*, or *Stercus Diaboli;* and by no means employed as frequently as it should be. From the results of our own experience we can, however, affirm that it is a very valuable remedy; especially in the latter stages of bronchitis and pneumonia, in simple catarrh where the cough is dry and harsh, in some examples of pertussis, and in laryngismus stridulus and other spasmodic or convulsive affections not dependent on disease of the nervous centres. It sometimes produces nausea, but this is soon overcome; and, although children do not become fond of it, yet we have found little or no difficulty in getting them to take it, after the first feeling of repugnance has been conquered.—Vide Formulæ.

Narcotics and Sedatives.

The remedies of this class allay pain and morbid sensibility, diminish inordinate action of the organs of respiration and circulation, and induce sleep: they are of the greatest value in the treatment of the diseases of children, but require to be prescribed with caution and judgment. Their effects are due to their diminishing the heart's action, by repressing the nervous influence; consequently the results obtained from their use will entirely depend on the state of the system at the time of their administration, and upon the dose employed. Thus, if used in a plethoric state of the vascular system, or in too large a quantity, they give rise to great depression, to giddiness and staggering, to weakness of the retina, so that vision is rendered imperfect, and to stupor which may end in profound coma.

Consequently they are contra-indicated in plethora, in all cases in which there is undue determination of blood to the brain or to any other vital organ, and in highly inflammatory states of the system generally. On the other hand, in all cases of gastric or intestinal irritation, protracted diarrhœa, dysentery; in the later stages of inflammatory affections; in disorders due to the suppression of the cutaneous exhalation; in all spasmodic diseases, as trismus nascentium and hooping-cough; and in irritable conditions of the system from causes beyond our removal, as dentition, continued fever attended with great restlessness, the exanthemata, &c.: in all such, sedatives and narcotics are invaluable.

Opium—the most important and most certain of the narcotics—consists of the inspissated juice of the unripe capsules of the *Papaver somniferum* or white poppy. Its primary operation is stimulant; its secondary, sedative and narcotic: in infants and young children the secondary effect follows very quickly upon the first.

The fact that the infantile constitution is peculiarly susceptible to the influence of opium has led to the expression of various opinions on the propriety of employing this agent during the early months of life: some having argued, that in consequence of this general susceptibility and because two or three drops of laudanum have proved fatal to infants only a few days old, therefore the remedy is too dangerous for us to employ. It appears to us, however, that this circumstance merely teaches us to use a valuable weapon with great caution, not to discard it; to carefully select the cases in which it may seem necessary; to assiduously and narrowly watch its effects; to administer it in very small doses; at proper intervals; and above all to take care that soothing cordials, syrups, and all quack poisons containing it, be banished from the nursery, so that it may never be surreptitiously given.

The appearances which are produced by the prolonged administration of opiates or by an overdose are peculiar and readily recognizable. In one case which came under notice the nurse allowed that *she was obliged* continually to administer some poisonous carminative to obtain a night's rest. In this case—as in all similar ones—there was general emaciation, languor, a withered sallow countenance, red and swollen eyelids, derangement of the digestive organs with loss of appetite, and constipation of the bowels with white stools. As the cause of these appearances was gradually removed, the child improved; and under the care of a more conscientious nurse ultimately got strong and well.

The dose of opium for an infant must of necessity be very small, and—as a rule—an interval of five or six hours should elapse between each administration of the medicine; while in many cases it will only be necessary to renew it once or twice in the twenty-four hours. If the tincture of opium be employed, not more than the eighth or fourth of a drop should be given to an infant under three months; at six months, half a drop; and so on gradually until the fourth year, when about two drops may be administered as a full dose.—Vide Formulæ. The compound tincture of camphor is a convenient form for infants, in doses of two to ten drops, according to the age.—Vide Formulæ. With some practitioners *Dover's powder* is regarded as a mild and safe opiate, a quarter of a grain being used during the first three months, and from half a grain to two grains, from the first to the fifth year.

Syrup of white poppies is a favourite remedy with many, but unfortunately it varies a good deal in strength.

In children beyond one year of age, very minute quantities of *morphia* are often very beneficial, especially for the relief of hooping-cough, spasmodic cough, &c. Half a drop of the liquor morphiæ acetatis or hydrochloratis of the British Pharmacopœia may be given every six hours in any pectoral mixture to a child twelve months old.

Besides administering opiates by the mouth, we may take advantage of the delicacy and susceptibility of the skin to obtain their effect by inunction, or even by the application of opiate plasters. A liniment of opium rubbed over the abdomen or spine will often remove the irritation and fretfulness caused by dentition; or will moderate convulsions arising from an irritable state of the bowels. We may procure the full effect of this remedy, by administering it as an enema, in doses of one, two, or three drops—according as the age is, six months, one, two, or four years: this method being especially valuable in some instances of protracted diarrhœa.

Lastly, we would mention, that Godfrey's Cordial and Dalby's Carminative are sometimes surreptitiously used by nurses. The former contains one grain and the latter a quarter of a grain of opium in each fluid ounce.

Hyoscyamus has a less soothing and tranquillizing effect than opium, but possesses the advantage of neither quickening the pulse, checking secretion, nor causing constipation. It may be used in small and repeated doses, as a sedative and soporific in sleeplessness; as an anodyne to allay irritation and pain; as an anti-spasmodic, in disorders attended with spasm; and indeed in all cases where—a narcotic being needed—opium is objectionable or disagrees.

Digitalis is a direct sedative; lessening irritability, lowering the pulse, and augmenting the secretion of urine. Its use is indicated in inflammatory affections where we desire to lower the heart's action, in anasarca dependent on cardiac disease, and in some spasmodic affections where opium cannot be tolerated. Combined with *Lobelia inflata*, it is said to be a good substitute for antimony, in pneumonia, acute bronchitis, &c. There seems reason to believe that it is a cumulative medicine; hence its effects must be watched, and it should be discontinued if it produces any nausea or exhaustion.

Acidum Hydrocyanicum Dilutum.—There are two preparations of this acid in common use; one—the Pharmacopœial—contains 2 per cent. of acid, while the other—Scheele's—has from 4 to 5 per cent., though its strength varies somewhat. In medicinal doses it is sedative and anodyne, allaying pain dependent upon nervous irritability, and depressing the force of the circulation. It is useful in gastrodynia, in obstinate vomiting not caused by inflammation, in laryngismus stridulus, in chronic coughs, and in some cases of pertussis.

Chloroform.—The vapour of chloroform may be safely used to narcotize children, but care must be taken that the narcotism is not carried to the extent of producing stertorous breathing: it must also be administered slowly, well diluted with atmospheric air, and when the stomach is empty. In some cases—especially, perhaps, in infants and very young children—the chloroform may be diluted with an equal portion of spirits of wine; or, what is better, the sulphuric ether may be used, unless its powerful smell be deemed objectionable. Anæsthesia has been employed with decided success in infantile convulsions, laryngismus stridulus, pertussis, chorea, and spasmodic hiccough, &c. It may also be advantageously tried in many cases to allay pain and to remove sleeplessness. Dr. Snow pointed out that when death arises from the inhalation of chloroform, it is due to the direct influence of this agent upon the heart, whose action it stops. In case of accident he believed artificial respiration, promptly and efficiently performed, affords the best prospect of a successful issue. For internal administration the spiritus chloroformi is the best preparation; and should always be given in mucilage or some such suspending fluid.

Chloral Hydrate is an invaluable sedative, anodyne, and antispasmodic, causing great muscular relaxation. It does not produce headache, nausea, or constipation of the bowels like other medicines of its class, besides which its action is more uniform. It is most useful in sleeplessness, restlessness, asthma, pertussis, convulsions, epilepsy, chorea, and many cerebral affections. Its action is augmented by combination with the bromide of potassium.

Purgatives.

Purgatives cause evacuations from the bowels in one of two ways, either by increasing the peristaltic motion of the intestines, acting especially upon the muscular coat, or by promoting secretions from the mucous lining, in which case they act on the mucous coat directly, and only indirectly influence the peristaltic action by augmenting the bulk of the bowel contents. The milder purgatives—laxatives or lenatives—operate chiefly by their influence on the muscular coat of the intestines; the stronger ones—hydragogues and drastics—stimulate the mucous follicles and exhalants, and produce copious watery stools.

Purgatives or Cathartics are principally used in the diseases of children:—1. To empty the alimentary canal, and thus to relieve any morbid symptoms due to the presence of undigested food, morbid secretions, worms, retained feculent matters, and poisonous agents. 2. To establish healthy alvine secretion, when this is defective. 3. To promote the elimination of morbid poisons contained in the blood. 4. To relieve plethora and congestion by diminishing the volume of the circulating fluid. 5. To augment the action of the absorbents. 6. To relieve inflammation—especially inflammatory affections of the head—by exciting secretion and exhalation from the extensive mucous surface of the gastro-intestinal canal, by promoting expulsion of morbid agents from the system, and by favouring absorption of some of the effused products. 7. To promote the secretions of the liver and pancreas. 8. To affect remote organs by their operation as revulsives or counter-irritants, which they accomplish by the impression they make on the intestinal nerves, by the determination of blood which they produce to the abdominal organs, and by the augmentation of secretion which they effect.

The cathartics or purgatives which we chiefly employ are of the milder class; and even these have to be used with caution, for nothing is more pernicious than the indiscriminate exhibition of "opening medicines" to children. A judicious alteration of the food will often obviate recourse to aperient medicine; and should, therefore, generally be tried when there is merely torpidity of the bowels without any derangement of the secretions.

The following are some of the more commonly used drugs of this class:—

Castor Oil is an efficacious aperient when we merely wish to empty the intestinal canal. It is prompt in its action, acts thoroughly, and does not produce griping or flatulence. It is especially valuable in the diarrhœa which results from taking improper food, since it thoroughly removes the offending matters; in habitual constipation, when care is taken gradually to diminish the dose; and also in inflammatory affections of the abdominal viscera, when a mild but efficient purgative is indicated.

Manna.—The flake manna should alone be used. It is nutritive as well as laxative, but is uncertain in its action, and apt to gripe. Its sweet flavour is its best recommendation. It should be dissolved in warm milk and water, or in some innocent demulcent fluid.

Carbonate of Magnesia is a mild, antacid, tasteless, and somewhat sedative aperient. It may be mixed with the milk or other food, and given overnight, or it may be combined with other purgatives. Occasionally, when the stomach is very irritable, magnesia saturated with lemon-juice will be tolerated after all other aperients have been vomited.

Rhubarb acts as an astringent tonic in small doses, as a mild aperient in larger quantities. Hence it is very efficacious in mild diarrhœa, inasmuch as it first expels the irritating cause, and then acts as an astringent. It is also considered to be especially useful in the constipation of strumous children, acting as an alterative on the constitution, and helping to restore the tone of the stomach and intestines.

Saline Aperients.—The n[illegible]salts are useful in the febrile and inflammatory affections of [illegible]ood, when it is necessary to gently deplete the system. They produce copious liquid stools, but do not always clear out the bowels of their solid contents. Hence it is often necessary to administer castor oil or rhubarb, before resorting to them, or to combine them with other aperients. The salts most used are the sulphates of potash or magnesia, or the bitartrate of potash.

Jalap is an irritant drastic purgative, well adapted for clearing out the over-worked alimentary canal, when not contra-indicated by the existence of inflammation of the intestines, or of any of the pelvic viscera. It acts principally upon the muscular coat of the bowel. It is best administered in combination with some other purgative; as with ipecacuanha, in pulmonary affections; or with calomel, in torpidity of the liver; or with scammony in verminous diseases; or with the sulphate of potash—when we wish to deplete by producing copious serous discharges from the bowels.

Scammony is adapted for children in whom there is a torpid and inactive condition of the abdominal viscera; as a hydragogue cathartic in dropsy and cerebral affections; and as an anthelmintic. Its special applicability to the latter is due to its marked action upon the mucous coat of the bowel, in the folds of which the ascarides usually ensconce themselves. It should not be given alone.

Aloes is a stimulating purgative, with special action on the muscular coat: it is not often employed for children, on account of its bitterness. It may be beneficially employed to promote the secretion of bile. As it acts specifically on the lower intestines it is very valuable as an anthelmintic.

Stimulants.

Stimulants give rise to excitement, by promoting the extrication and expenditure of nervous influence, thus increasing the action of the heart: but excitement is not strength; on the contrary it leads to exhaustion. (Billing.) Stimulants sometimes act indirectly as tonics by exciting the nervous system, and thus temporarily imparting power to the digestive organs; so that stimulants with good diet, may in this way become valuable tonics.

Stimulants are divided into two classes—general or diffusible, and specific stimulants. In the first division we have many vegetable substances, which owe their stimulant power to an essential oil, as camphor, ether, and ammonia; and alcoholic fluids, as wine, beer, &c.: while in the second section are, strictly speaking, a very large number of medicines, many of which have been classified under other designations, such as purgatives, expectorants, &c. As examples of these agents, it is only necessary to mention terebinthinate medicines, which stimulate the bronchial and pulmonary mucous membrane: preparations of cantharides, which act on the mucous lining of the genito-urinary organs; and the alkaloid of the *strychnos nux-vomica*, which excites the excito-motory functions of the spinal cord. We employ stimulants to remove depression, exhaustion, and debility; to correct special nervous states due to debility; to promote convalescence after acute disease; and to excite certain secretions. They are generally contra-indicated in plethoric states, or in the early stages of acute inflammatory conditions, and in acute hæmorrhages accompanied with fever; and should never be administered unnecessarily—as they often are by nurses—to infants and young children, since they readily induce excitement and subsequent depression.

Ammonia is a valuable diffusible stimulant, acting promptly and without affecting the head, as happens with alcoholic drinks. In the latter stages of fevers, in some pulmonary affections, as chronic bronchitis, in exhaustion from protracted disease, or from treatment of a too lowering nature, it is especially indicated. The carbonate of ammonia may be given dissolved in some aromatic water, where an antacid stimulant is required; or the aromatic spirit of ammonia, may be exhibited in milk, or any simple infusion, when the vital powers are depressed, or when the child is troubled with flatulent colic, spasm, &c.—Vide Formulæ; *Stimulants.*

The vapour of Sulphuric Ether is powerfully anæsthetic, but less so than chloroform: hence it is sometimes used to narcotize children, though its pungent odour—which to some persons is very unpleasant—is an objection to it.

The Compound Spirit of Ether, a combination of sulphuric ether, rectified spirit, and ethereal oil, is a good diffusible stimulant and anti-spasmodic: being especially useful in flatulence, hiccough, low fevers, and spasmodic affections.—Vide Formulæ.

Oleum Terebinthinæ is a good general stimulant for children; the administration of one or two drops mixed with milk, or honey and barley-water, or the yolk of an egg, suffices to remove depression, and quickly to relieve flatulence or spasm. It is valuable sometimes in protracted diarrhœa, and it has also anthelmintic powers.

Tonics.

Tonics are agents which gradually and insensibly increase the tone and power of the system: while stimulants, on the other hand, are believed to excite action rapidly, without increasing real strength. Tonics give power to the nervous system to generate or secrete the nervous influence by which the whole frame is strengthened.

Many tonics—as the pure vegetable bitters—chiefly owe their value to their action on the stomach; through this means they exercise an important influence on the system at large, by improving the tone of the digestive organs. Some agents possess a twofold power, containing both a stimulating and a tonic principle, as cascarilla, chamomile, &c.

Tonics may be arranged first of all under two heads, vegetable and mineral. The former being again classified into aromatic bitters; astringent bitters; demulcent bitters; and pure or simple bitters: as types of each of these we may mention respectively cascarilla, oak-bark, calumba, and quassia.

Tonics are indicated in cases of atony or debility, in anæmia, in convalescence from acute diseases, in many convulsive and neuralgic affections, and in some forms of dyspepsia. Under their judicious use the appetite increases, the pulse becomes stronger, and muscular strength greater, and the soft solids firmer. As a consequence, the functions are all more energetically performed, and there is a greater power of endurance.

All the varieties of *Cinchona* bark are tonic, astringent, and anti-periodic. Either of them may be used in cases of great weakness, where it is necessary to make a powerful impression; in all cases of debility unaccompanied by inflammation of the alimentary canal; and in diseases which assume a periodic character. The advantages of the sulphate of quinine are that it is more easily administered from the dose being small, and that it is frequently better retained on the stomach. It has been found especially beneficial in infantile erysipelas, in sloughing phagedæna, in cancrum oris, in strumous ophthalmia, and in periodical affections. It is often advantageously prescribed with the mineral acids, during the sequel of remittent fevers; in malignant scarlatina, after the stage of excitement; and in purpura and pemphigus. In the advanced stage of hooping-cough, where the pulmonic irritation is dependent on debility, the combination of quinine and ipecacuanha has proved serviceable. Dr. Martin of Giessen has made some careful experiments to determine the action of quinine, and the following are the results of his observations,—1. That quinine limits the pathological migration of the blood corpuscles into the tissues of the membranous and parenchymatous organs exposed to the air, both when it is given subcutaneously, and when it is directly applied to the part. 2. It produces this effect, (*a*) by impairing the vital properties of the existing white corpuscles, (*b*) by hindering the generation of new white corpuscles, and (*c*) by restraining the dilatation of the vessels. 3. Quinine acts as an antiphlogistic by reducing all the visible factors of suppurative inflammation. 4. The use and the efficacy of quinine in other pathological conditions distinguished by multiplication of white corpuscles—*e.g.*, typhus, leukæmia, &c. —is based upon and explained by its relations to the life and the formation of these corpuscles.

The various salts of iron act as tonics almost entirely by increasing the quantity, and improving the quality of the blood corpuscles. Under their use, the appetite becomes greater, the digestion is improved, the pulse increases in frequency and fulness, flesh is gained, and the general strength is augmented. These changes occur slowly and gradually; but the improvement is more permanent than that derived from any other tonic. The use of iron is indicated in all cases where there appears to be a decrease in the proportion of the globules; and hence more particularly in general debility, in anæmia, and especially in the cachectic diseases of strumous or tuberculous children. Most of the ferruginous compounds may be administered to children; but the preparations of the peroxide, the ammonio-citrate and the potassio-tartrate are probably the most delicate and best adapted to children.—Vide Formulæ; *Tonics.*

PART II.

GENERAL DISEASES.

CHAPTER I.

FEVERS.

The term Fever is one which has been and may be applied to a great variety of circumstances in childhood, all of which are characterized by a certain amount of febrile disturbance, but which need not in the sense in which we here use the term have any direct relation to fever proper. For instance, we may have febrile disturbance, the result of inflammatory action in any important part, or from derangement of the digestive organs, or from constitutional sympathetic disturbance consequent upon some local irritation. In this chapter, however, we propose to consider three distinct varieties of fever—viz., continued fever, intermittent fever, and the eruptive fevers.

I. CONTINUED FEVER.

The study of Continued Fever in children is perhaps one of the most important which can engage the attention of the physician, and though for the most part the phenomena which they present are very much the same as occur in the case of adults, yet there are certain differences which it is important to bear in mind, and which not unfrequently make the diagnosis a matter a much greater difficulty in the child than in the adult.

Dr. Murchison, whose elaborate *Treatise on Continued Fevers* has placed his name in the foremost rank of English physicians, and has made him second to none as an authority on this subject, classifies the continued fevers of Britain in the following order:—

A. Non-Specific.	I. Simple Fever caused by .		Exposure to sun, fatigue, surfeit, &c.
B. Specific . .	II. Endemic	Pythogenic, enteric, or typhoid .	Poison contained in emanations from sewers, &c.
	III. & IV. Epidemic	Typhus, caused by	The accumulated exhalations from squalid human beings.
		Relapsing Fever . .	Famine.

With regard to the non-specific (I.) and to the specific (III. and IV.) epidemic varieties, these are so seldom met with in children in comparison with the endemic (II.) form, that we need only consider the latter in the two varieties or degrees as they occur in early life: and be it understood that by this term we intend to include all those varieties of fever which have hitherto been described under the names of simple infantile or remittent fever; confident as we are that all these are but different degrees of one and the same disease—viz., *typhoid*, or, as Dr. Murchison prefers to call it, *pythogenic fever*.

Pythogenic fever is, we believe contagious; it occurs in childhood more frequently with boys than with girls, and much more often in the autumn months than at any other time of the year; relapses sometimes occur; and cerebral or pulmonary complications occasionally arise to increase the danger. It must not be confounded with the simple irritative fever which is produced by dentition, improper food, &c. Formerly it used to be thought that this disease could be induced by the presence of worms in the intestinal canal, and by various constitutional or local derangements: hence a great variety of names were used to designate it. Now, however, it is pretty generally understood that the disease is essentially the same as that which occurs in adults, and is admitted to be true typhoid or pythogenic fever. Children seem to be peculiarly liable to it, and in them it exhibits a more markedly remittent character than in adults. With some authorities the disease is believed to be much more rare than it really is, because many cases are by them described as gastric fever, though what is the difference between the two it would be difficult to say. Dr. Murchison affirms that in the cases of so-called gastric fever he has " rarely failed to discover the characteristic spots of enteric fever;" and he adds, " my opinion is, that in all cases of 'gastric fever' the disease is really enteric fever, or that the febrile symptoms are due to derangement of the stomach and liver, from non-specific causes."

Symptoms.—Typhoid or pythogenic fever occurs in children in a mild, and in a more severe form; but between the one and the other there are various shades or degrees. In cases of a mild kind, the disease comes on very gradually and insidiously; the earliest symptoms that attract attention being loss of appetite, great thirst, and mental depression, so that the child is no longer lively and cheerful. During the day, also, it is listless, indolent and peevish; and though drowsy towards the evening, yet its nights are restless, and there is a want of sound refreshing sleep. When these indications of ill health have persisted for a few days, it is noticed that the skin is hot, at some hours of the day dry, at others covered with perspiration; the breath is offensive; the bowels are generally loose, the evacuations being unhealthy and offensive; and sometimes there is obstinate constipation. Vomiting is not a common symptom at the outset of the disease, and it seldom occurs as a marked feature, being certainly less frequent than in the eruptive fevers, and in cases of inflammation of important organs. The pulse is always quick from the first, often too quick even to be counted, and there is marked increase of temperature, especially at night, when all the symptoms are aggravated. In the milder cases, such as those we are now considering, there is frequently a remittent character about the symptoms, the child appears to be almost well in the early part of the day, but in the afternoon he begins to get languid and feverish, and as night comes on the febrile disturbance is again more or less severe.

In the second week the symptoms increase in severity; the child passes very restless nights; he screams, moans, grates his teeth, and starts in his sleep; suffers much from thirst, and occasionally sickness and vomiting come on, with perhaps slight delirium. At this stage there is almost always exacerbation of the fever towards evening, with a remission of the symptoms as morning approaches; occasionally there is a second though less severe exacerbation about eleven o'clock in the day. In mild cases there is seldom any rash; but should any appear it generally occurs at this time in the form of rose spots, so characteristic of typhoid fever. These spots are less frequently present in children than in adults, and their severity bears no relation to the febrile disturbance. They appear more frequently about the second week, but are often so pale as not to be detected. The skin is usually very hot, dry, and rough, and the child is constantly picking about the lips, nose and fingers; there is always great loss of flesh, with debility. The state of the tongue is often very characteristic; it is red at the tip and sides, but white and coated in the centre, the papillæ standing out as bright red points. The abdomen is distended with flatus, is somewhat tender, and there is most frequently *gurgling on pressure in the right iliac fossa.* Sometimes a lateral or pendulum motion of the head is observed, the fixed point being at the occiput, which rests on the pillow. During the second week the bowels are generally still more relaxed and the motions offensive, looking almost like yeast, and being evidently in a state of fermentation and decomposition. About the end of the second, or the beginning of the third week, the symptoms begin to abate, and day by day the child improves in health, although some time elapses before convalescence is completely established; recovery is always slow and tedious, the appetite lingers, and thirst remains, the child still wastes, and both flesh and strength are reduced out of all proportion to the amount of fever existing.

In the second, or severe form of fever, the symptoms just enumerated commence more suddenly and are more strongly marked. There is vomiting, great drowsiness, headache, and sometimes slight rigors; the countenance looks heavy and anxious; the mind wanders at night; the skin is hot and dry; the pulse frequent, varying from 120 to 150; and from the sixth to the tenth day a scanty eruption of rose spots makes its appearance upon the back, thorax, or abdomen. As the disease progresses, the restlessness and delirium become aggravated; the tongue is dry, brown, and glazed; the abdomen becomes tumid and tender; the respiration is accelerated, and there is a peculiar short dry hacking cough, which is very characteristic, with a feeling of oppression at the chest; there is generally diarrhœa, the motions being exceedingly loose and offensive, of a light brown colour; the urine is scanty and high coloured; and all the evacuations are passed unconsciously. By the end of the second week the patient is, probably, reduced to the most emaciated and helpless state, he is drowsy, and extremely prostrate, with a rapid and almost imperceptible pulse, and an exceptionally high temperature, ranging between 103° and 105°, or even 108° Fah. Sometimes the rash is very distinct, though the spots are usually few in number, and occasionally sudamina are abundant. A short, sharp, dry, hacking cough is very commonly present, especially at night, but there are seldom any physical signs of chest complications. When apparently in the worst possible condition, about the third week, slight signs of amendment begin to show themselves, and day by day the improvement increases, until at the end of some weeks health is restored.

Unfortunately, however, this is not always the case, for sometimes the prostration increases, and with it the febrile disturbance; the pulse gets quicker and weaker, the temperature heightens, and the mental or nervous phenomena are aggravated, there is more delirium at first, and much more profound stupor, so that in the state of unconsciousness the evacuations are passed involuntarily. Convulsions, however, very seldom occur except as a prelude to death, and when this happens, which it does now and then, though happily very rarely, it is generally the result of exhaustion, the vital powers succumbing to nervous prostration.

When recovery takes place, we shall generally observe at first a slight diminution in the frequency of the pulse and in the temperature, a return of moisture to the skin, the tongue becomes cleaner, sleep is less disturbed, nourishment is more easily taken, the expression brightens, the evacuations become more healthy, and strength slowly, very slowly, returns.

Diagnosis.—In many cases the fact of a contagious history will materially help in diagnosis: if we are in doubt there is a trustworthy symptom in the occurrence of the *peculiar eruption of spots*, pale rose or pink in colour, with a slight elevation of the surface, disappearing on pressure but for a moment, and being developed in successive crops, each lasting from two to five days. They often exist on the back and nowhere else, and usually appear from the fourth to the seventh day, being earlier in children than in adults. Two or three are sufficient for a diagnosis "provided it is ascertained, by encircling them with ink, that they disappear after two or three days while one or two fresh ones are developed elsewhere." In the absence of spots, *diarrhœa* is a most important symptom, and the pale yellow ochrey liquid and extremely offensive nature of the motions is very characteristic. *Age* is also an element of consideration, as the disease very seldom occurs before the fifth year, and is extremely rare under three years of age; and *sex*, as it occurs more than twice as often in boys as in girls. The course of the *temperature* is pathognomonic. It has a regular "gradual ascent for four or five days." The evening temperature is about 2° higher than that of the morning, and there is a remission of about 1° compared with the previous evening, so that there is a daily rise of about 1°, and at last the evening temperature comes to be from 103·5° to 104°. The stationary period varies greatly in duration, according to the severity of the case. The temperature may reach 107° or 108°. The other more prominent symptoms are the extreme prostration, which is out of all proportion to the apparent symptoms, the remittent character of the fever, the delirium, and, we may add, the negative evidence, in the absence of any well-marked symptoms of other diseases.

The diseases with which it may be confounded are, acute tuberculosis, tubercular meningitis in its early stages, pneumonia, gastro-enteritis, chronic peritonitis, and some of the eruptive fevers in their early stages In each of these, however, careful observation will always reveal some distinctive features which separates it from the disease we are considering.

As regards *Prognosis*, happily the cases which terminate fatally are few in number. The mortality of one in ten in France, as given by MM. Rilliet and Barthez, is certainly much too high for this country. In stating this, however, we must add that such a rate is too high only in consideration of there being many cases which are entirely overlooked; according to Dr. Murchison 14·43 per cent. is about the average mortality in cases under ten years of age. Our prognosis will be influenced by the height of the temperature, the duration of this increased heat, by the amount of the diarrhœa, and by the severity of abdominal and cerebral symptoms. The amount of rash is of little moment, but great heat of skin at first is an unfavourable symptom. Relapses are always bad, and often end fatally: the supervention of inflammation in any part is an evil omen: a sudden rise, or a rapid and extreme fall of bodily heat is a bad sign, and death usually occurs by asthenia.

The *Morbid Anatomy* consists of disease, generally ulceration, of the agminated or solitary glands of the ileum; sometimes we see these variously affected, the glands being either enlarged by deposits, or they have begun to soften or ulcerate, or they may be in the stage of cicatrization. In addition to these changes, there may be splenic enlargement and softening, pneumonia, or bronchitis, pericarditis, and passive congestion of the brain and spinal cord.

Treatment.—All fevers, whether in the adult or the very young, seem to have a certain natural course, and to terminate in the re-establishment of health. But, as in the treatment of all disease, so in this instance, there are certain general objects which should be kept in view. It was well-observed by Pitcairn,—"I do not like fever-curers. You may *guide* a fever; you cannot *cure* it. What would you think of a pilot who attempted to quell a storm? either position is equally absurd. In the storm you steer the ship as well as you can; and in a fever you can only employ patience and judicious measures to meet the difficulties of the case."

Now, the indications for treatment in cases of pythogenic or typhoid fever are, 1. To improve the condition of the blood. 2. To aid in the elimination of the poison, and of the products of the tissue metamorphosis. 3. To support the vital powers. 4. To relieve urgent symptoms. 5. To treat local complications.

In every case the patient must be kept in bed, to remain there until convalescence has been established.

As general improvers of the blood, we believe there are no remedies which can compare with the mineral acids. We give the preference to the dilute nitro-muriatic acid, which may be given in five minim doses to a child seven years of age, freely diluted with water and sweetened. To this may be added a little gentian or quinine, the latter seeming to be of great service in cases where the fever assumes a distinctly remittent character. Occasionally we have added four or five grains of the chlorate of potash to each dose, with, as it has seemed to us, evident advantage: indeed, we have the highest opinion of the value of this salt in all cases of blood poisoning where a depurator is required; it seems not only to have a beneficial effect in this respect, but also to exercise a certain stimulating influence as an oxidizing agent. A few drops of chloric ether may be added with advantage, partly as an agreeable addition, partly for its stimulating properties.

The chief emunctories by which we may hope to exercise some eliminating influence are the skin and the kidneys. We may not attempt to use the bowels for this purpose, owing to the exceedingly irritable condition which the fever induces in them. Very often indeed our skill may be taxed to the utmost to quiet and soothe the bowels, and to prevent the diarrhœa, which is a usual accompaniment of this fever, running on to a mischievous extent. We should be careful, therefore, not to regard this symptom, as some have done, as an effort of nature to rid the system of something deleterious, which we may help by the administration of aperient medicines; by so doing we shall assuredly increase the irritation, and may indeed hasten bowel perforation.

The action of the skin will best be maintained by the exhibition of ammonia, especially in the form of carbonate, half a grain to a grain every four hours, together with the liquor ammoniæ acetatis in half drachm doses, and warm diluent drinks, with some slight stimulant, such as whisky, which we think the best: these are the remedies on which we chiefly rely for securing free diaphoresis, without at the same time producing any depressing effect. As diuretics, those which have also a certain stimulating influence are in our judgment to be preferred: hence we should recommend for that purpose nitric ether, juniper, the compound decoction of broom, together with, as drinks to be taken *ad libitum*, tea and coffee.

The main object towards which all our treatment must necessarily be directed, is the support of the vital powers, and this we shall best secure, not by the administration of stimuli, but by a judicious selection of suitable nourishment. It should be given in the liquid form, and such as is most easily digested, milk, mutton, veal or chicken broth, arrowroot, custard, light puddings, ground rice and milk. When there is much depression, and especially if there be distaste for food, the diffusible stimuli, tent or port wine, and brandy or whisky, given always if possible in arrowroot, must be resorted to, in quantities proportioned only to the amount of exhaustion and to the effect produced. We have often been surprised at the amount of stimulants which children can not only tolerate but seem even to require and to derive benefit from. No arbitrary rule can be laid down in this respect, we must be guided entirely by the circumstances of each case. But though we thus freely advocate resort to stimuli in many cases, we would not by any means recommend them in all. On the contrary, we believe that, as a rule, in children they may be dispensed with except in small quantities, and occasionally; but we are equally sure that they are sometimes required, and that then they are productive of the best results. The chief indications for the use of stimuli are a weak, feeble, and quick pulse, with general depression and languor of the nervous and muscular systems, and a high temperature as tested by the thermometer, alcohol having the power of reducing this. Stimuli are seldom required till after the first week of the attack, when depression of the vital powers sets in. Profuse perspiration, delirium, or coldness of the surface is a call for their use, so is a dry, brown, or coated tongue, and they are doing good if the tongue cleans, if the surface warms, and if the delirium ceases.

With regard to the treatment of local complications, these will in the main be the same as when those diseases, which are chiefly inflammation of the lungs, bronchial tubes, kidneys, bowels, &c., arise under ordinary circumstances, apart from fever. But there is one symptom which, as being a very common accompaniment of this fever, and not unfrequently leading to a fatal issue, it may be well here to notice—viz., diarrhœa. Our main stay in the treatment of this symptom is the astringent class of remedies, and especially the vegetable astringents; krameria, logwood, catechu, and kino are the best, and with them the compound aromatic chalk powder with opium, may be usefully combined. Sometimes warm linseed and laudanum poultices constantly applied over the abdomen are of great service. In other cases Dover's powder with the hydrargyrum cum cretâ answers best, and occasionally minute doses of ipecacuanha have a very beneficial effect. It may be laid down as a rule that one or other of these remedies is required if the bowels are relieved more than twice in the twenty-four hours. On the other hand, if the bowels are confined, the utmost caution is necessary before resorting to the use of purgatives, lest their action exceed our wishes. When really required, castor oil is perhaps the best that can be given.

During the convalescence, bitter vegetable tonics with the mineral acids, and a carefully regulated but nutritious diet, are the remedies most required. Change of air is also of great advantage, especially by the seaside.

II. INTERMITTENT FEVER.

The Intermittent Fever of infants and children, though arising in the same way and from the same causes as that of adults, has this important difference—that the paroxysms are not very regular, and that the attack is not accompanied by rigors. Moreover, it is a very rare disease in children under five years of age.

There are three *Varieties* of intermittent fever or ague from which adults suffer—viz., Quotidian, Tertian, and Quartan ague; of which the tertian is most common. Infants at the breast and children seem generally to suffer from the quotidian. When the paroxysm occurs at the same hour every day, it is called quotidian ague; when every other day, tertian, though secundan would be more appropriate; when it is absent for two whole days, and then recurs, quartan. In the first variety the interval is twenty-four hours, in the second forty-eight, in the third seventy-two. The time between the commencement of one paroxysm and the beginning of the next is termed the interval; that between. the termination of one paroxysm and the commencement of the next, the intermission. In quotidians the paroxysm occurs, for the most part, in the morning; in tertians, at noon; in quartans, in the afternoon. The first is most common in the spring, the second in the spring and autumn, the third in the autumn.

The chief *Predisposing Cause* of ague is debility, but those who have once suffered from it are more liable to a second attack. The *Exciting Cause* consists of certain emanations or effluvia from the surface of the earth, known as malaria. It is well to remember that malarious districts are most dangerous at night, and that the agueish poison lies low, or, as Sir Thomas Watson says, "loves the ground."

Symptoms.—An ague fit is composed of three stages, the cold, hot, and sweating; the first being almost always absent in children, the second well marked, and the third only slightly manifested. The *cold* stage, in adults, is ushered in with feelings of languor and chilliness, though the heat of the body may not be really lessened; sensations as of streams of cold water running down the back, and shivering; the teeth chatter, and the whole frame is shaken; there is exhaustion; often urgent thirst; the countenance appears anxious, the features shrunk and pale, and the eyes dull and hollow; the pulse is small; the respiration hurried and oppressed; and there is a peculiar mental irritability. The duration of this stage varies from half an hour to four hours, and is gradually succeeded by the *hot* stage, which is one of reaction. The surface of the body then becomes dry and intensely hot, the temperature being raised considerably above the natural standard; the mouth is parched, there is excessive thirst, frequent full pulse, a painful sense of fulness in the head, and great restlessness, general uneasiness, and sometimes delirium. This condition continues rarely less than three, or more than twelve, hours; then follows the *sweating* stage, commencing with perspiration, which appears first on the forehead and breast, and gradually extends over the whole body. The pulse and breathing become natural; the headache, heat of skin, and thirst abate; the bowels and the kidneys act freely; and all the distressing symptoms are relieved, so that the patient, if the case be recent, often feels in perfect health soon after the fit has passed off.

Now, in children. these successive stages are considerably modified, so that at first sight the symptoms seem scarcely to indicate the existence of ague, though at the same time the disease is unmistakably intermittent in character. In the first place, the rigor is almost, if not altogether, absent, and its place is supplied by a period of remarkable depression and nervous exhaustion; occasionally the nervous system is so seriously affected that a convulsive fit occurs in place of the rigors. Following this is a period which corresponds with the hot stage in the adult, but in the child it is a good deal prolonged and is more markedly severe, the skin being extremely hot and dry, and the febrile disturbance very great. Lastly, instead of the sweating stage, the child becomes dull, listless, and depressed, showing evident signs of a feeling of illness, but without any well-marked or characteristic phenomena. Professor Bohn points out that there is always more or less enlargement of the spleen, and that if this be rapid, it is accompanied by acute radiating pains during the hot stage; and that a gastro-intestinal catarrh is generally present, and may be considered a valuable diagnostic sign.

It is evident from the foregoing that the disease presents some important differences in the child and adult, and the divergence is seen yet more in the fact that, owing probably to the deeper impression which is made upon the nervous system of the child than of the adult by the malarial poison, during the intervals of the attacks, instead of appearing comparatively well, as is the case in adults, the child gives evidence of some blood-poisoning by the depressed, listless, fretful, and irritable condition which remains. Lastly, the attacks themselves recur with much less regularity, and are also very unequal in their duration, differing again in these respects from what occurs in the adult. It may be added that the younger the child, the more marked is the divergence from the phenomena which occur in after life.

Pathology.—As regards the pathology of the disease, there is probably little or no difference between the adult and child; certainly the effects, as far as the spleen is concerned, differ but slightly, for in the few cases which we have seen this organ underwent considerable enlargement; and, whether as a consequence of this and of the changes wrought thereby in the blood, or from the action of the malarial poison on the blood itself, or upon the nervous system, the condition of anæmia or cachexia is very speedily produced in children so affected.

The *Treatment* of these cases is sufficiently simple; we have in quinine one of the few so-called specifics of which the art of medicine can boast; it is certainly as efficacious in children as in adults, and is a remedy which seldom or never fails. Steel, in the form of steel wine, is also a valuable medicine to counteract the destructive action which appears to be going on in the blood in ague; it may conveniently be given with the quinine. The dilute nitro-muriatic acid will also be of service, especially when there is much dry heat of skin and thirst. The removal from a malarial district is essential to the cure, and where possible the seaside is of all places to be preferred.

III. THE ERUPTIVE FEVERS.

The eruptive fevers may be regarded as continued fevers, with a characteristic eruption superadded. The diseases of this class are—*Small-pox*, *Cow-pox*, *Chicken-pox*, *Measles*, and *Scarlet Fever*. In some points these affections resemble the diseases of the skin which will be found described under the Orders Exanthemata, Vesiculæ, and Pustulæ: hence writers on cutaneous disorders often treat of them under these heads. But as this arrangement is neither scientific nor convenient, we prefer to consider them as eruptive fevers.

The diseases now to be described have this common character:—They have a period of incubation—that is to say, a certain time elapses between the hour of infection and the establishment of fever, during which the patient's health is apparently unaffected; they are accompanied by fever, which is generally of an inflammatory character, and runs a well-defined course; they are attended by an eruption which goes through a regular series of changes; for the most part they affect an individual once, and once only, during his lifetime; they arise from a specific contagion; and their progress cannot be stayed by medicine.

The following table shows the period of incubation, date of appearance of the eruption, and time of its disappearance, in measles, scarlet fever, and small-pox.

Disease.	Period of Incubation.	Eruption appears.	Eruption fades.
Measles . .	10 to 14 days	On 4th day of fever	On 7th day of fever.
Scarlet fever	4 to 6 days	On 2nd day of fever	On 5th day of fever.
Small-pox .	12 days	On 3rd day of fever	Scabs form on the 9th or 10th day of fever, and fall off about the 14th.

The mortality from small-pox, measles, and scarlatina, is still very high, and on this ground alone the diseases in question demand our serious attention. The tables show that the death-rates of measles and scarlet fever are very much higher during the first few years of life than subsequently. For instance, in the last report of the Registrar-General, though the total number of deaths from measles at all ages in the year 1876 amounted to 2,408, no less than 612 occurred in children under five years of age, the numbers rapidly diminishing after that period. The same thing obtains in the case of scarlatina, as may be seen by reference to the following table:—

	Under 1 Year.	1 Year.	2 Years.	3 Years.	4 Years.	5 Years.	10 Years	Total under 5 Years.	Total at all ages.
Small-pox .	287	74	93	84	74	261	162	612	2,412
Measles .	2,282	3,866	1,687	918	499	598	57	9,252	9,971
Scarlatina .	970	2,396	2,854	2,685	2,140	4,369	780	11,045	16,893

The symptoms of the eruptive fevers are usually well-defined, and to the practical physician their diagnosis is not generally a matter of much difficulty. Occasionally, however, instances are met with where one or more of the most important symptoms are absent: a fact which ought constantly to be borne in mind in the treatment of the obscure diseases of childhood. Thus, there is no doubt that cases of scarlatina occasionally happen where there is an absence of all external efflorescence; patients may even die from the effects of the scarlatinal poison before there has been time for the eruption to appear. Dr. Graves very truly remarked in his *Clinical Lectures on the Practice of Medicine*, that—"A constitutional affection may display its existence by only one or two of the numerous symptoms which usually accompany it: and this strange occurrence seems more frequent in the case of diseases produced by contagion and morbid animal or vegetable poisons, than in the case of maladies generated by causes developed in the system itself."

The possibility of the co-existence of any two of these eruptive fevers in the same person has long been questioned, though the weight of testimony inclined to a negative opinion. Lately, however, some cases have occurred which seem to establish the contrary. Steines, for instance, records one case of measles and scarlatina, and another of measles and small-pox. Monti also met with two cases in which scarlatina and measles were combined. These cases were all carefully observed, and their antecedent history as to contagion was clearly made out.

In this country also, Mr. Marson, in a paper published in the *Medico-Chirurgical Transactions*, upwards of twenty years ago, on the co-existence of variola and scarlatina, adduces several instances of the simultaneous occurrence not only of those two fevers, but also of variola and rubeola, variola and pertussis, variola and vaccinia, rubeola and scarlatina, rubeola and vaccinia, rubeola and pertussis, varicella and vaccinia, and pertussis and vaccinia. Dr. Murchison has also demonstrated the same point in his work on Fevers already alluded to.

It is certainly not very uncommon to meet with cases in which the diagnosis is a matter of great difficulty, owing to the symptoms at one time resembling those due to measles, at another those due to scarlatina. Formerly it used to be thought these were in truth only modifications of one and the same disease, but a more enlightened pathology, and closer clinical observations, have demonstrated beyond dispute their dissimilarity in symptoms, course, pathological tendencies and complications, and of course also in the treatment required. All these points will be made apparent as we proceed in our description of them.

1. *Rubeola, or Measles.*

We have seen that measles is a common and fatal disease of early life. The proportion of deaths, in England, in 1876, under five years of age as compared with the total mortality at all ages was, for small-pox, about 25 per cent; for measles, 93 per cent; and for scarlet fever, 65 per cent. Measles is, therefore, to a very great extent, a disease peculiar to children. If however, we extend the age to ten years, we then find that scarlet fever is the most fatal of the three maladies named.

It may, however, assume a violent type and attack all ages. A notable example has been recorded of the accidental introduction of the disease into the Fiji Islands. In the course of three months, one fifth to a quarter of the inhabitants fell victims to its ravages, some 20,000 deaths occurring during the epidemic.

Symptoms.—After a period of incubation, varying from ten to fourteen days, during which there is little disturbance of the general health—perhaps a feeling of languor, with a slight cough—symptoms of fever with catarrhal complication begin to show themselves, and are often either preceded or followed by rigors. Occasionally, but very seldom, the disease begins by an attack of convulsions, which subsides as soon as the rash comes out; the conjunctivæ, the

Schneiderian membrane, and the lining membrane of the fauces, larynx, trachea, and bronchi, soon become affected. In a day or so there is swelling of the eyelids; the eyes are suffused and watery, and there is some intolerance of light; sneezing is a very constant and often a very troublesome symptom; and there is a dry hollow cough, with hoarseness and dyspnœa; drowsiness and a tendency to delirium sometimes comes on, with great heat of skin and frequent and hard pulse. The eruption usually comes out at the end of the third or beginning of the fourth day of the disease, seldom earlier, often later. It consists at first of small circular spots, like flea-bites, which gradually coalesce into blotches; these are of a dull dingy-red colour, presenting frequently a crescentic or horse-shoe shape, and are slightly raised above the surface of the skin. The rash appears first on the forehead and face, and gradually extends downwards: it begins to fade on the seventh day in the same order, and, without producing that marked desquamation which is such a striking feature in scarlatina and erysipelas, it nevertheless usually takes place more or less freely, and has this further peculiarity, that whereas in scarlatina the peeling takes place in large flakes, especially about the hands and feet, in measles, on the contrary, it occurs in the form of small bran-like or powdery particles. The diarrhœa, which often sets in as the rash declines, is for the most part beneficial.

It is worthy of notice that the fever does not abate—though the cough often ceases—on the appearance of the eruption, as is the case in small-pox; nor does the severity of the attack at all depend upon the quantity of the rash. Very often the symptoms become most alarming just when the rash begins to disappear.

The symptoms which are chiefly peculiar to measles, and which more than all others, perhaps, serve to distinguish it from scarlatina, with which it is most liable to be confounded, are those referrible to the chest, and it is here that the most fatal complications, such as bronchitis and pneumonia, arise. As a rule, the more important symptoms begin to decline at the end of the first week, and in a fortnight the patient is usually convalescent.

Unfortunately, however, measles does not always terminate thus favourably, pulmonary complications are far from uncommon, and against these we ought to be constantly on our guard. So long as the cough and catarrhal symptoms continue slight, we need be under no apprehension, but if the breathing becomes short and difficult, the cough frequent, the face congested and livid, and if at the same time the rash is of a dusky hue, and does not come out freely and well, we may reasonably fear that evil consequences will ensue. A careful examination of the chest should at once be made and suitable remedies be adopted. We should be especially anxious if the child exhibits any characteristics of a tubercular tendency, or if there be any indications of a diathetic condition.

The period at which these pulmonary complications are most likely to arise, is either before the rash is fully developed or just as it begins to decline; the former, if the symptoms be also severe, is most to be apprehended. It is well in all cases of measles to institute examinations of the chest once every day, that we may know exactly when mischief begins, as it sometimes runs an extraordinarily rapid course: we have known one case terminate fatally within forty-eight hours of the first appearance of pulmonary mischief.

Sometimes children with measles are afflicted with a peculiarly virulent form of ophthalmia, which resembles in many respects the strumous ophthalmia of infants, and is very apt to end in permanent disorganization of the eye and blindness. Sometimes the ear is similarly affected, and permanent deafness may result. In other cases an obstinate form of diarrhœa comes on, by which the child is greatly prostrated, he loses flesh and strength, and is reduced to such a low ebb, that it is often extremely difficult to pull him up again, and should there be any latent tubercular or other diathetic tendency, the chances of a fatal issue, or of permanent impairment of health, are greatly increased.

The contagion of measles is particularly strong; being most powerful during the eruptive stage, and especially during the early part of this period. Some observers have stated that rubeola is most contagious at the time of desquamation; but this was clearly disproved during an epidemic of measles which broke out in the Färoe Isles in the year 1846, and the same fact has been abundantly demonstrated since.

Prognosis.—This must depend upon the mildness or severity of the chest symptoms: the complications most to be feared are severe ophthalmia, bronchitis, and pneumonia, or laryngeal and croup affections. In the great proportion of fatal cases death is due to pneumonia. Probably about one case in fifteen ends fatally from this cause alone: but besides this, cases now and then run a very chronic course, especially where there is any diathetic taint, and finally die of that diathesis in some one or more of its manifestations, or are left in a state of almost complete disablement.

In regard to *Treatment*, exposure to cold is to be carefully avoided. The patient should be confined to bed, in an apartment moderately warm. This is a matter of very great importance, especially in cold weather; nothing so predisposes to pulmonary or intestinal complications as a chill. The diet should be light, but nutritious, and where there is any diathetic taint, stimulants must be had recourse to: in other cases mucilaginous drinks, gentle aperients, and mild diaphoretics should be given. A draught containing one drachm of the liquor ammoniæ acetatis, ten or twenty drops of the spiritus ætheris nitrici, and half an ounce of camphor mixture, may be given to a child six years old every four or six hours. When the cough is very troublesome a little syrup of poppies should be given at bedtime, or some paregoric may be added to the mixture in the proportion of ten to fifteen minims to a child five to eight years of age. Dr. West speaks very highly of the use of a small blister, the size of a shilling, to the trachea; it should not be on for more than three or four hours. If the diarrhœa proves exhausting, one or two grains of Dover's powder will help to check it; if there be much debility, nourishing broths, and wine or cordial draughts, will be called for.

The state of the three great cavities must be carefully watched, especially towards the decline of the eruption. Should any complications arise, they must be treated vigorously and without hesitation, but not on the depleting or so-called antiphlogistic system. This applies especially to the pulmonary complications which, as we have said, sometimes run a very rapid course. Counter-irritaton, as it is termed, should be immediately resorted to, turpentine stupes being the best form. If the cough be troublesome, but without any expectoration, the breathing hurried and difficult, the skin hot and dry, the pulse rapid, and the condition generally is one of plethora, then some antimonial preparation, of which the wine is the best, with ipecacuanha and squills, will be productive of good results. If at the same time, as often happens, the rash does not come out well, a hot bath will be of great service, and affords much relief. These are the cases in which those who practise depletion would use either the lancet or leeches, but, as our readers are already aware, we do not advocate these remedies in any but the most exceptional cases. After the disease has subsided, the patient should be warmly clad, and not allowed to go out of doors for some few weeks.

Rötheln.

We have already stated that competent observers have called attention to the fact of the co-existence of two of the eruptive fevers. Rötheln is a hybrid of measles and scarlatina. In this affection, the characters of the two disorders are more or less combined.

Symptoms.—There is an incubation stage, varying from a week to a fortnight, and marked by headache, lassitude, and disordered bowels; this is followed by pyrexia, coryza, suffusion of the conjunctivæ, and sore throat. On the third or fourth day of the fever, a red papular or mottled-looking rash appears simultaneously over the body. At first it is not raised, but subsequently it forms irregular patches of red blotches, varying in size from a sixpence to that of a crown piece. The eruption fades in the course of a week or ten days, and is followed by a furfuraceous desquamation. During the course of the affection the head, face, and neck become swollen, the cercival glands and the tonsils enlarge, and the tongue assumes the characters of that usually observed in scarlatina.

The *Treatment* consists in guarding against cold, alleviating any thirst, regulating the bowels, and combating complications that may arise. Although the fever may be very intense, the *prognosis* is generally favourable.

Scarlatina, or Scarlet Fever.

Scarlatina, or Scarlet Fever, is an infectious and contagious febrile disease, characterized by an extensively-diffused bright-scarlet efflorescence of the skin, and of the mucous membrane of the fauces and tonsils, commencing about the second day of the fever, and declining about the fifth; it is often accompanied by inflammation of the throat, and sometimes of the submaxillary glands. Like measles, it is, though not essentially, yet chiefly, a disease of childhood, and though absolutely more fatal than measles or any other acute specific disease so far as regards the total number of deaths at all ages, it is relatively much less so in children under five years of age. It appears from the tables of the Registrar-General which we have already quoted in our introductory remarks on the subject of the eruptive fevers, that the highest mortality occurs at the ages of two, three, four, and five years; the total number at all ages being for the year 1876, 16,893, of which 11,045 occurred under five years of age. The corresponding numbers in the case of measles were 9,971, of all ages, to 9,252 under five years of age, showing that measles is far more fatal in early life than scarlatina.

Scarlatina is undoubtedly more contagious, and more often assumes a virulent form, than measles. It is also remarkable for the length of time during which the poison may linger about a once infected place. Dr. Richardson, in *The Asclepiad*, relates a case where, notwithstanding that every precaution was taken in the way of cleansing and purifying not only the house, but also the clothes, furniture, &c., children who came to the house four months after, took the disease and died. In one case which came to our knowledge, a severe case of scarlatina had occurred in December, the house was thoroughly cleansed and purified, and remained empty for several weeks; it was then inhabited again, and nearly four months afterwards two of the inmates were attacked with scarlet fever and had it most severely. They were not conscious of having been near any other source of infection. Surgical operations seem to render persons peculiarly liable to this disease. Occasionally it occurs more than once in the same subject. The average mortality from scarlatina is about one in seventeen cases in adults, and probably one in twelve in children under fifteen years of age.

There are three varieties of this disease—viz., Scarlatina ***simplex***, in which the skin chiefly is affected; scarlatina ***anginosa***, in which both skin and throat are implicated; and scarlatina ***maligna***, in which all the force of the disease seems to be expended upon the throat.

Scarlatina simplex commences—after a period of incubation which varies from a few hours to four or six days—with slight fever, rigors, vomiting, lassitude, headache, pains in limbs and sore throat. The temperature generally rises rapidly to 104° or more. The eruption appears on the second day generally, but it may occur on the first: it appears first about the neck, face, and chest, in the form of numberless red elevated points, which, in twenty-four hours from their first appearance, cover the whole body. They usually disappear on gentle pressure, but return again immediately that the pressure is removed. On the limbs, but especially about the fingers, there is a diffused continued efflorescence; while on the trunk the rash is sometimes distributed in irregular patches. The eruption is of a bright-scarlet colour, most distinct about the loins and in the flexures of the joints. In severe cases the rash is not merely scarlet but in places assumes a dull bluish dusky appearance. The efflorescence commonly terminates by desquamation of the cuticle, which begins about the end of the fourth or fifth day, though sometimes not till even the twentieth or twenty-fourth day, and generally it commences on those parts where the rash first appeared. On the face and trunk the desquamation is in the form of scurf or branny scales; while on the hands and feet large flakes of cuticle are detached, so that sometimes a glove or slipper of scarf skin comes away at once. In the more severe cases, we have known the skin to be shed several times by successive desquamation, especially about the feet and hands.

The pulse in scarlatina is generally quick, and often out of all proportion to the severity of the case, being due probably rather to the extent of inflamed skin and consequent nervous excitability.

At the same time that the efflorescence has been spreading on the surface of the body, the mucous membrane of the mouth, fauces, and nostrils has also been affected. The inflamed throat is indeed one of the distinguishing features of scarlatina, and though in the mild form we are now considering it is by no means prominent, yet it is always sufficiently marked to attract attention, and in scarlatina anginosa it forms the leading feature. The tongue also puts on an appearance which is especially characteristic of scarlatina. At first it is covered with a thick white fur, more particularly along the centre, through which the red elongated papillæ project: as this fur clears away, the tongue becomes clean, preternaturally red, and of a strawberry appearance. The affection of the mucous membrane of the mouth, &c., terminates by resolution; with the disappearance of the rash the febrile symptoms subside; and in the milder cases, the disease terminates at the end of eight or nine days, leaving the patient, however, often very weak.

Dr. Ringer has made some interesting observations in regard to temperature in cases of scarlatina, and he finds that there is an evident tendency to the occurrence of crises on the days numbering five, ten, fifteen, and so on from the commencement of the attack; and further, that when there is a decided diminution of temperature occurring every morning, a favourable issue may confidently be expected. On the other hand, any marked and persistent rise in the temperature indicates the existence of some latent mischief in one or more important organs.

Scarlatina anginosa is ushered in with more violent symptoms than the preceding. There is headache with some delirium, and occasionally, though rarely, convulsions, the heat of skin is more pungent, and there is marked prostration of strength. About the second day there is stiffness of the neck, uneasiness in the throat, hoarseness, and painful deglutition. The fauces, palate, uvula, and tonsils are red and swollen; and the inflamed surfaces are covered with an exudation of coagulable lymph. Occasionally the tonsils and adjoining parts ulcerate, and the glands of the throat become very painful and swollen, and may even suppurate. As this inflammation goes on, all the febrile symptoms increase, and the skin becomes very dry and hot, the temperature rising considerably. The efflorescence does not observe the same regularity in this as in the more simple form; it does not appear so early, is delayed to the third or even the fourth day, comes out in scattered patches on the chest, arms, and back, and shows a tendency to vanish the day after its appearance, and to reappear partially at uncertain times.

In a few rare cases this variety of scarlet fever passes off without any rash appearing, there being nothing but sharp febrile disturbance, with the peculiar sore throat and red strawberry-coloured or scarlet fever tongue. In such cases the diagnosis is often extremely difficult, and it is only when other members of the family are attacked and have the rash that the true character of the affection is disclosed.

With the fading of the eruption about the fifth or sixth day, the fever and inflammation of the throat begin to abate, although the throat often remains sore for a week or ten days after the disappearance of the rash. Occasionally this variety of scarlet fever assumes a more aggravated form; being accompanied with an acrid discharge from the nostrils and ears, with deafness, and inflammation of the parotid and cervical glands—sometimes going on to suppuration and abscess. In the more severe cases the glands about the throat and neck swell up so that the head is almost fixed, and the throat is sometimes nearly double its proper size. With all this there is great constitutional disturbance, and a sort of typhoid condition is induced, the tongue losing its florid colour and becoming dry and brown. Sometimes the discharge from the nose is exceedingly irritating and offensive.

In some cases of this kind very severe attacks of coryza come on, resembling somewhat the early stages of measles.

During the progress of the disease, particular attention should be paid to the internal organs, since there is a strong predisposition to inflammation of the serous and mucous membranes.

Scarlatina maligna, described by Cullen under the title of *Cynanche maligna*, differs but little in its symptoms, at first, from scarlatina anginosa. The fever, however, soon assumes a malignant or typhoid character; and considerable cerebral disturbance is superadded to the affection of the fauces and skin. There is great irritability, restlessness, and delirium,—the delirium being sometimes violent, but usually of the low muttering kind. The tongue is dry and brown, tender and chapped; the lips, teeth, and gums are covered with sordes; and the breath is extremely fœtid. The throat is not much swollen, but appears of a dusky-red hue, while the velum, uvula, and tonsils are covered with dark incrustations, consisting of exudations of lymph; in some cases there is gangrenous inflammation of these parts, followed by sloughing. The cervical glands are often involved in the inflammation. The rash is exceedingly irregular as to the time of its appearance and duration, it often comes out late, and disappears after a few hours, being renewed several times during the progress of the disorder. It is at first of a pale hue, but soon becomes changed to a dark livid red, it is patchy, and the skin feels very rough to the touch, there being numerous little points or acuminate papillæ which give a kind of nutmeg-grater feel to it; petechiæ also often appear upon the skin, and are persistent even beyond the actual attack.

In many instances this malignant form of scarlet fever terminates fatally on the third or fourth day, and sometimes even within twenty-four hours of the first appearance of the symptoms. It is always a disease of extreme danger, and only patients who possess a vigorous constitution have any chance of surviving it; great hopes may, however, be entertained if the seventh day be passed.

The descriptions given above may be taken as fairly representing the several varieties of the disease, but it may be well here to note some few points of special interest in the clinical history of these cases; and first with regard to the desquamation which is a special feature in scarlatina. In a few rare instances no desquamation whatever occurs, but these are generally exceptionally mild cases, and as a rule probably the more severe the attack the freer is the desquamative process. The date of commencement is exceedingly variable, as is also its duration; it may begin at any time between the 6th and the 21st day, and may last from a fortnight to a month. Sometimes it occurs in the form of small bran-like scales, in others the cuticle is shed in large flakes.

The condition of the urine is a matter which should always be carefully noted, especially during the stage of desquamation. It ought to be tested at least every other day, for as we shall see presently, one of the most serious results of scarlatina is an albuminous condition of the urine.

Children who have suffered from scarlatina are very liable to have their health permanently affected, and if there be any latent constitutional or diathetic tendency, it is pretty sure to become manifest during the convalescence of scarlet fever; hence tuberculosis, scrofulosis, or rachitis are in one or other of their many forms very apt to be developed. But the most frequent and most serious sequel to scarlet fever is a peculiar renal affection, which is usually accompanied with general anasarca: it is characterized by the secretion of scanty, smoky-looking, albuminous urine; the subcutaneous areolar tissue being infiltrated with serum accompanied often by dropsy of the larger serous cavities. It usually occurs about the twenty-second day from the commencement of the fever; and it is a curious fact that this scarlatinal dropsy is more frequent after a mild than after a severe attack; owing, probably, to the want of caution which is often observed in such cases during the period of desquamation. Probably the course of events is somewhat as follows: the patient gets exposed to cold, and the exposure suddenly arrests the functions of the skin; the scarlatinal poison which was being eliminated by the cutaneous excretion is thrown back into the circulation; the kidneys are then, as it were, called upon to eliminate that material which the skin has been rendered temporarily incapable of doing, owing to the arrest of its functions: the contaminated blood is thus sent to them in larger quantities than they can bear; engorgement ensues, and very shortly *acute desquamative nephritis* is set up, which though it may occur from cold, from the cholera-poison, and from some other diseases, is still much more common after scarlatina than in any other disease; a description of it, and the treatment required, will be found on referring to the Chapter on Diseases of the Urinary System. It may be noted that in addition to the presence of albumen in the urine, there is often a marked diminution in the amount of chlorides and of urea. Under the microscope there are seen at first a few pale waxy transparent tube-casts the size of the normal tubes. After a while some blood discs are discoverable, with a few epithelial cells, and either bloody or granular tube-casts. All these morbid products disappear gradually as the kidneys recover themselves, but occasionally they are so seriously damaged that suppuration occurs, and the patient finally succumbs with general anasarca. Or, partial recovery takes place, and permanent albuminuria results.

In a few cases collections of fluid take place into the serous cavities, and these are generally more serious than when the effusion occurs into the subcutaneous cellular tissue.

During the progress of scarlatinal dropsy—as indeed from dropsy produced by other causes—children are liable to suffer from a condition known as *œdema of the lungs*, the symptoms of which in the commencement very much resemble those of bronchitis; at the end of two or three days, however, the breathing becomes greatly hurried, dyspnœa or even orthopnœa sets in, there is violent action of the heart, and the pulse is often exceedingly feeble. On practising auscultation and percussion we shall probably find no signs to account for the severity of the symptoms; for there is neither bronchial respiration, crepitation, nor diminished resonance. But unless relief be given by free purging, the hot-air bath, an antimonial emetic, and frequently-repeated doses of nitrous ether, the symptoms will certainly increase, the distress becomes very great, the countenance gets livid, and the child dies. On cutting into the lungs after death, they will perhaps be found loaded with reddish serum; an accumulation of fluid having taken place either into the pulmonary vesicles or into the areolar tissue surrounding them, and thus the entrance of air is impeded.

Amongst other sequelæ, scarlatinal patients are liable to diarrhœa; ulceration and sloughing of the fauces and pharynx; retro-pharyngeal abscess; scarlatinal bubo, affecting the parotid gland, or the adjacent cellular tissue, or the neighbouring lymphatic glands; pleurisy; pneumonia; pericarditis; otorrhœa; abscesses; and tenderness, redness, and swelling of the joints. A systolic murmur is sometimes heard at the left apex of the heart. It generally disappears with convalescence, but may be permanent. Lastly, a form of scarlatinal vaginitis is sometimes very intractable. They are all usually sufficiently well marked to be readily recognized, and their management differs but little from that which is required under other circumstances.

The *Diagnosis* of scarlatina is not generally a matter of much difficulty, in most cases the rash alone suffices to establish the point, but occasionally this is so peculiar as not to be trustworthy, the doubt will then be between scarlatina, measles, and roseola; the former is the brightest and reddest; the second is seldom so diffused, but is often in circular patches, and is more dusky looking; while the latter is not so bright or red as scarlatina, and is wanting in the characters of measles. If the diagnosis fails on account of the rash, we must then look to the peculiar red, strawberry-coloured tongue, the sore throat and the character of its inflammation, and the absence of the catarrhal symptoms which form so marked a feature in measles. Moreover, scarlatina appears within a week of the date of infection; measles not for a fortnight. The rash in scarlatina comes out in twenty-four hours after the accession of premonitory symptoms, in measles not for two or three days.

Treatment.—The treatment of scarlatina yet remains to be considered. The *simple form*, says Sydenham, is "fatal only through the officiousness of the doctor." It requires no treatment beyond confinement in the house for at least two or three weeks after all symptoms of the disease have disappeared; warm clothing, spare diet, and attention to the bowels, are also points to be attended to. In *scarlatina anginosa* the treatment is often much the same as that for many cases of continued fever. Sponging with tepid water, where there is great heat, is often very comforting to the patient, and seems to be beneficial in promoting a healthy action of the skin, and so of furthering the elimination of the poison. Dr. West, on the authority of Prof. Mauthner of Vienna, speaks very highly of the inunction of suet in place of the tepid sponging; it seems, he says, to relieve the intense burning heat of the skin better than anything else, but he does not ascribe any other virtue to it, unless it be that it "lessens the risks of some of the ordinary sequelæ of the disease." At first it is to be used twice a day, and once when the eruption is on the decline.

It is very important to secure if possible a system of perfect ventilation of the sick room, without draughts of cold air; emetics may be given with advantage when the tongue is much coated, and when nausea and irritability of the stomach exist; in severe cases where there is much delirium, shaving the scalp and the application of cold lotions will do good; while great caution is necessary in the use of antiphlogistic medicines such as antimony, and remedies which have a lowering or depressing effect; bleeding, even to the extent of two or three leeches, should be avoided, as alike uncalled for and injurious. Purgatives judiciously employed will often obviate the necessity for lowering measures of any other kind, but they must on no account be given too freely, or in too large doses. Saline and effervescing medicines are very grateful and cooling; and where the pulse is feeble, effervescing draughts containing an excess of ammonia will be beneficial. When there are decided symptoms of depression or collapse, wine, cordial draughts of ammonia, ether, camphor, and nourishing food, must be ordered.

The more we see of this disease the more convinced we are of the urgent necessity of avoiding cold or chill. By far the great majority of the sequelæ of scarlatina are the direct result of cold, dropsy probably never comes without it, and mild cases are quite as likely to take cold, or perhaps even more so, than the more severe. The best remedy if a chill is suspected is undoubtedly a hot air bath; it brings out the perspiration freely, and gives almost instant relief. For the sore throat there is probably nothing better than a mixture of chlorate of potash, quinine, mineral acid, and belladonna: borax and honey, or dilute dydrochloric acid and honey, will also be beneficial; and warm opiate and linseed-meal poultices to the throat will often give great relief.

In *malignant scarlet fever*, a supporting plan of treatment, such as that which is usually pursued in cases of typhus fever, alone offers any chance of success. The vital powers are generally so prostrated by the deadly influence of the poison, that unless we give freely of brandy, wine, and bark, they will fail altogether.

When seen early, however, the treatment of this variety may often be advantageously commenced by a mild emetic. The gangrenous ulceration of the fauces, which often complicates this form, will be best combated by the use of the so-called alcoholic stimulants, and the local application of a solution of the chloride of soda or glycerate of carbolic acid; but when the inflammation is very severe, the throat and fauces must be swabbed with a strong solution of nitrate of silver—gr. 10 to fl. oz. 1. The chlorate of potash drink will also be very useful. Chlorine itself is used by some practitioners, who speak highly of its good effects, in even the worst cases. Large doses of the hyposulphite of soda have been successfully given internally. Carbonate of ammonia has also been very highly extolled as almost a specific in this disease, but we cannot help thinking that its virtues have been greatly overrated. The fact is that in very many cases no drugs whatever are required, and there is none certainly which we think more deserving of continued use than the ammoniated solution of quinine; it combines the advantages of ammonia with those of quinine, and if the throat symptoms are not severe, so as to require the use of mineral acid and chlorate of potash, there is no drug we like so well as this.

If the secretion of urine be scanty, tea or coffee will be found of great service in increasing the action of the kidneys and thus eliminating urea.

For the treatment of renal dropsy, as of the other sequelæ and complications, the reader is referred to the portion of this work in which those diseases are considered.

As regards the *Prophylaxis* of scarlet fever, a good deal has been said and written about the value of belladonna. Its supposed efficacy is ascribed, by those who practise what is called homœopathy, to the fact that occasionally, but by no means universally, the administration of belladonna is followed by a redness of the skin with dryness and consequent soreness of the throat. The experiment has, however, been tried again and again, and a failure has frequently been the result; while the fact that the disease has not spread where the drug was given, is counterbalanced by at least an equal number of facts, where the same result was obtained without the use of the supposed preventive remedy. One well-authenticated history of its failure occurred in an epidemic of this disease which happened on board her Majesty's ships *Agamemnon* and *Odin* in 1853: the remedy in question was there freely tried, but without the slightest benefit. Another series of experiments was conducted by Dr. Balfour, at the Royal Military Asylum at Chelsea, the result of which was communicated by him to Dr. West in the following terms: "There were," he says, 151 boys of whom I had tolerably satisfactory evidence that they had not had scarlatina; I divided them into two sections, taking them alternately from the list, to prevent the imputation of selection. To the first section (76) I gave belladonna; to the second (75) I gave none; the result was that two in each section were attacked by the disease. The numbers are too small to justify deduction as to the prophylactic power of belladonna, but the observation is good, because it shows how apt we are to be misled by imperfect observation. Had I given the remedy to all the boys, I should probably have attributed to it the cessation of the epidemic." The internal administration of the sulpho-carbolate of sodium, in large doses, has also been advised as a preventive and disinfectant.

Vaccinia, or Cow pox.

Though in these pages we aim throughout at making this work as practical as possible, we yet cannot refrain now from stepping aside a little out of our beaten track, in order to give the student some idea of the history of a man who has done more probably for the saving of human life than any discoverer of ancient or modern times: we allude of course to Jenner, whose name will live as long as vaccination is practised among us.

Edward Jenner, the son of the Rev. Stephen Jenner, vicar of Berkley, in Gloucestershire, was born 17th May, 1749. While serving his apprenticeship to Mr. Ludlow, a surgeon at Sodbury, near Bristol, a young woman came to the house, and the conversation happening to turn upon small-pox, she said, "I cannot take the disease, for I have had the cow-pox." This observation made a great impression upon Jenner's mind, but did not bear fruit for some years.—After completing his professional education in London, during two years of which time he resided with John Hunter, he went to Berkley to practise; and seems often to have thought over the possibility of demonstrating the preservative powers of the cow-pox against small-pox. It was not, however, until he had taken his Doctor's degree at St. Andrews, in 1792, that he had leisure thoroughly to investigate the subject; and in 1795, he persuaded fourteen persons who had previously had the cow-pox to be inoculated for the small-pox, not one of whom—as he had hoped and anticipated—took the infection. His experiments were continued, and in 1798 he published the results and came to London. During the three months he remained in town, he could not induce a single person to be vaccinated; and the paper which he wrote for the Royal Society was declined by that learned body. After he returned home, Mr. Cline wrote and advised him to settle in London, assuring him of a practice of 10,000*l.* a year. Here is Jenner's reply:—"It is very clear, from your representation, that there is now an opening in town for any physician whose reputation stood fair in the public eye. But here, my dear friend, is the rub. Shall I, who, even in the morning of my days, sought the lowly and sequestered paths of life—the valley, and not the mountain—shall I, now my evening is fast approaching, hold myself up for fortune and for fame? Admitting it as a certainty that I obtain both, what stock shall I add to my little fund of happiness? My fortune, with what flows from my profession, is sufficient to gratify my wishes. Indeed, so limited is my ambition, and that of my nearest connections, that were I precluded from future practice, I should be enabled to obtain all I want; and as for fame, what is it?—a gilded butt, for ever pierced with the arrows of malignancy. The name of John Hunter stamps this observation with the signature of truth." However, it was absolutely necessary that Jenner should come to London to explain his views. He did so; he succeeded in satisfying the profession and the public that he had indeed been entrusted with "the mighty and responsible office of shutting one of the great gates of human death;" and his triumph was ultimately complete.

In 1807, Parliament voted Dr. Jenner 30,000*l.* as a reward for his discovery: in 1808, the National Vaccine Establishment was formed: in 1823, Jenner died: in 1840, a Bill passed the legislature for the extension of vaccination, and another Bill declared the practice of inoculation illegal: in 1853, compulsory vaccination was first established. Subsequently to this a statue to Jenner's memory was erected in Trafalgar-square, but this was allowed to remain there only for a very short time, its removal to the banks of the Serpentine being thought, we suppose by some very wise people, to be in that situation more in accord with Jenner's earnest longings for the saving of human life than when associated as it was with the statues of men whose lives were spent in widely different occupations.

There is no doubt that Jenner's discovery has greatly diminished the mortality from small-pox, and not only so, but it has also in a still more remarkable and noteworthy manner, lessened the occurrence of the disease. Notwithstanding all this, small-pox still figures high in our Mortality Tables, and is proportionally as fatal now as it was before the introduction of vaccination, especially among children. Within the last few years proficiency in vaccination has become a requirement with some of our examining boards, and it is important therefore on this ground that the student should be well acquainted with the characters of vaccinia.

In practising vaccination it is better to use recent lymph, which should be taken from vesicles between the fifth and ninth days, the seventh or eighth being probably the best. Three or four small punctures should be made with a sharp lancet on either arm, and the vaccine lymph inserted deep enough to come in contact with the absorbing surface of the cutis vera. In private practice it is important to bear in mind that, in the case of girls, as an eschar is usually left behind on the site of each vesicle, care should be taken to perform the operation sufficiently high on the arm for these not to be seen when a short-sleeved dress is worn. The young practitioner who forgets this little vanity on the part of his fair patients may perhaps be rather unpleasantly remembered in after-life.

According to the Act of Parliament, parents and guardians are obliged to have every infant vaccinated within three months from birth; unless, indeed, the child's state of health renders it necessary to postpone the operation. It is also enacted that all adults who have not been vaccinated or who have not had small-pox shall submit to this operation.

When vaccination has been successfully performed on a healthy child, an elevation may be felt over the puncture on the second day, accompanied by slight redness; on the fifth, a distinct oval or circular vesicle is formed, having an elevated edge and a depressed centre; on the eighth it is of a pearl colour, and is distended with clear lymph. This vesicle is composed of a number of cells, by the walls and floor of which the lymph is secreted. An inflamed ring or areola gradually forms round the base of the vesicle, and at about the eleventh day this begins to fade; so that the vesicle acquires a brown colour, and by the end of the second week becomes converted into a hard round scab. This falls off about the twenty-first day; leaving a circular, depressed, striated cicatrix, which is usually permanent in after-life.

The constitutional disturbance which accompanies vaccination is generally very slight, though sometimes it is severe and gives rise to a good deal of febrile reaction: about the eighth day the infant is rather restless, the bowels are perhaps confined, the skin is hot, and the sleep is disturbed. These symptoms, however, disappear spontaneously in two or three days.

Some interesting experiments have been made by Dr. Gustav Wertheim, of Vienna, tending to show that the frequency of the pulse is permanently increased by the process of vaccination. Thus, a man aged thirty-eight, and a woman aged thirty-three, neither of whom had suffered from small-pox, were vaccinated for the first time; the pulse, in both cases, increased in frequency up to the sixth day after vaccination, when it began to decline; but it never declined—at least not for the four months during which the observations were continued—as low as it was before the introduction of the vaccine virus. For example, before vaccination the man's pulse was on an average 66; afterwards the average was 78.

With regard to re-vaccination, though nothing certain is known as to the time within which the protective influence of the vaccine remains; yet if due care be taken to secure purity in the lymph employed, it would be well to advise its repetition at the period of puberty; although probably in the majority of cases where vaccination has been properly performed during infancy it may not be really necessary, yet in some instances the protection which has been afforded certainly seems to die out, and hence requires renewal. Moreover, it is certain that re-vaccination can do no harm; while it will, doubtless, increase the patient's feeling of security.

When small-pox occurs after a child has properly taken cow-pox, as it sometimes will, the disease is much milder and shorter, is unaccompanied by secondary fever, and is less likely to lead to disfigurement or permanent impairment of the constitution; hence it is called *modified* small-pox. But the protection afforded by vaccination is within a fraction as great as that given by inoculation; while the former is unattended with any danger, and does not—like the latter—tend to keep alive and propagate the disease. At the Royal Military Asylum, Dr. Balfour has shown that, out of every 1,000 boys admitted protected by various variola, 6·15, and out of every 1,000 protected by vaccination, 7·06 were attacked subsequently by small-pox: while it is very remarkable that whereas the deaths from secondary small-pox amounted to 2·05 per 1,000 of those attacked, not one fatal case occurred in those affected with modified variola. Moreover, from records kept at the Small-Pox Hospital, Mr. Marson has proved that the mortality from small-pox in persons well vaccinated, and having more than two cicatrices, was less than 1½ per cent.; in persons reputed to be vaccinated not more than 3 or 4 per cent. under favourable circumstances, and not more than 7 under unfavourable; while the mortality of the natural small-pox varied from 20 to 35 per cent.

It may be well here to refer to some objections which have been, and are still, urged against vaccination; one of these, indeed the principal one, is that it is a means by which various contaminations are introduced into the system. For ourselves we are convinced that this objection is not sustainable by evidence which can be relied upon. No doubt impurity in the vaccine, or want of proper cleanliness in the instrument used for making the puncture, or other carelessness in the operation, may lead to serious consequences, perhaps even to syphiltic inoculation, or to a kind of pyæmic condition.

We are satisfied, however, from what has recently been written on this subject, that most of the fears entertained in regard to the communicability of syphilis by vaccination, as of other contagious diseases, and especially those of a cutaneous character, are entirely groundless, so far as concerns the evidence which is brought forward in support of them. On this subject we cannot do better than quote some remarks from two very able papers on "The Vaccination Question," by the late Dr. Anstie, which appeared in the third volume of the *Practitioner*, and which we entirely endorse. First, as to the possibility of septic infection, and consequent erysipelas or pyæmia, Dr. Anstie, while admitting this, very properly replied that it is ridiculous to charge it to vaccination itself, because it is clearly the result of culpable negligence on the part of the vaccinator, for either he must have taken lymph from a child actually suffering from acute septic disease; or else the lymph used has undergone, by being kept too long or kept improperly, more or less of that putrefactive change which affects all animal matters placed in such circumstances; or lastly, he has taken the lymph from a vesicle which had already become a *pustule*. In regard to the question of vaccino-syphilis, not only does he quote the report of Mr. Simon to the effect that 539 medical men, in answer to inquiries, denied with scarcely an exception that syphilis can be conveyed as a true result of vaccination, but further, "the direct experiments of Cullerier and others, on the effects of intentional admixture of syphilitic matter and vaccine, and of the vaccination of large numbers of persons with vaccine matter intentionally taken from persons suffering with constitutional syphilis, added positive evidence of the most powerful kind against the possibility of transmitting syphilis by an ordinary vaccination with lymph taken out of a true Jennerian vesicle."

Evidence such and so weighty as this ought surely to satisfy the most incredulous: but there is yet one other fact of crushing weight, viz., that even the poison of small-pox, one of the most subtle known to the physician, does not affect the lymph of a true Jennerian vesicle, where a person is suffering from small-pox contracted just before vaccination, and too late therefore to profit by its protective influence.

Admitting then, as we do, the possibility of some contamination through careless vaccination, we ought to be extremely careful, first, to use a perfectly clean instrument for the punctures, and secondly, to take the utmost care to avoid carrying with the lymph any blood or other secretion from the person supplying it. If these rules are rigidly observed, vaccination is unquestionably an unmixed benefit to the human race.

The best means of preserving vaccine lymph is undoubtedly in hermetically-sealed glass capillary tubes. It may be kept pure and sweet for years in this way, and it is probably the only really safe method; for being an organic product it is of course liable to decomposition by exposure to the air, and hence the objection to glass slides, ivory points, lancets, and such like. Where convenient, of course vaccinating from arm to arm is the best and most certain method.

Variola, or Small-pox.

Variola, or small-pox, may be defined as a contagious and infectious fever; commencing with lassitude, headache, stupor, mental depression, rigors, heat of skin, vomiting, and pain in the back and loins; and succeeded on the third day by an eruption of pimples, which in the course of a week inflame, become vesicular, and finally suppurate. Sometimes it is accompanied by a similar eruption on the mucous membrane of the nose and mouth; sometimes by swelling and inflammation of the subjacent cellular tissue; and occasionally, by affections of the nervous system. When the vomiting and pain of the back are violent, they are generally the precursors of a severe form of the disease.

The period of incubation, or the time which elapses from the hour of infection to the establishment of the fever and the first appearance of the eruption, is twelve days; during which the patient's health is apparently unaffected. When, however, the disease is received into the system by inoculation, seven days only elapse between the reception of the virus and the development of the fever. There is probably no contagion so powerful or so certain as that of small-pox; and the period when transmission seems most likely to happen is during the suppurative stage. As a rule, the susceptibility of the constitution to the action of the poison is exhausted by one attack: but cases of recurrent small-pox have occurred, though they are extremely rare.

The peculiar eruption which is characteristic of the disease always begins to show itself on the third day of the fever, and usually appears first on the face, then on the neck and arms, then on the trunk, and lastly, on the lower extremities. At first the eruption consists of very small, bright red spots, slightly raised ; on the second or third day they form distinct papules, flattened on their tops, and having a peculiar solid, hard, dense feeling, compared to that of shot under the skin: these generally ripen into vesicles. About the fifth day a depression occurs on the top of the vesicle, which now becomes *umbilicated*; the contents become purulent and the vesicles pass into pustules, the suppuration being usually completed by the ninth or tenth day, at which time the pustules break, and crusts or scabs begin to form. In four or five days more these scabs, or some of them at least, fall off.

The fever of small-pox is somewhat remarkable, inasmuch as it remits entirely when the eruption comes out, but reappears about the end of the eighth day in the distinct form of the disease, and on the eleventh day in the confluent form.

The severity of small-pox bears an almost direct relation to the quantity of eruption. When the pustules are few, they remain distinct and separate from each other; when very numerous, they run together, coalesce, and lose their regularly circumscribed circular form. We thus have a division of this disease into two varieties—namely, *variola discreta* and *variola confluens*. The former is seldom attended with danger ; the latter is never free from it. The eruption on the face may be of the confluent form while it is scanty elsewhere ; and in such a case the disease is termed confluent. Sometimes the pustules are so numerous that they touch each other, but nevertheless do not coalesce; the disease has then been described as of the *cohering* or *semiconfluent* form.

In *variola discreta*, the eruption at first is papular, but on the third day a small vesicle, with a central depression, appears on each papule, and contains some thin transparent lymph; around which an inflamed areola forms. About the fifth day of the eruption, or the eighth of the disease, the vesicles lose their central depression, become turgid, and hemispheroidal. Suppuration has by this time occurred, and so the vesicles have become pustules, which contain some yellowish matter. A peculiar disagreeable odour now begins to emanate from the patient, and is so characteristic that when once smelt it can never be forgotten; so that from it alone the disease may often be diagnosed. About the eighth day a dark spot appears on the top of each pustule, the cuticle bursts, the matter oozes out, and the pustule dries into a scab. In about four or six days more the crusts fall off, leaving a purplish-red stain, which slowly fades: where the pustule has gone so deep as to destroy a portion of the true skin, permanent disfigurement in the shape of the so-called pitting or pock-mark—results.

Variola confluens, being a more serious form of the disease, is usually ushered in by more violent fever, with greater sickness, and more intense pain in the back, than in the discrete variety. The eruption comes out earlier; the eyelids swell, so that by the fifth day the patient is often unable to see; the parotid glands are affected; there is salivation also; and the limbs swell. The vesicles on the face run together into one bleb, containing a thin brownish ichor; the face is pale and doughy. The vesicles on the trunk and extremities, though often not confluent, have no areola, and are pale. On the breaking of the pustules, large black or brown scabs are formed, exhaling great fœtor; the pulse is rapid; and there is great debility and restlessness. The mucous membranes generally become involved; those of the nose, mouth, larynx, and trachea are the seat of an eruption; the tongue and palate are often covered with vesicles; the throat is very sore; and there is difficulty of swallowing, with hoarseness, dyspnœa, and cough; the glottis sometimes becomes so narrowed that suffocation may ensue. Delirium frequently occurs; and is usually of the low muttering kind. When to the foregoing symptoms malignancy and putrescency are added, the disease becomes what is called *malignant small-pox*.

The principal difference, however, between variola discreta and variola confluens is in the *secondary fever;* this sets in usually about the eighth day of the disease in the former, and on the eleventh day in the latter. In variola discreta this secondary fever is generally but very slightly marked; the patient being merely hot, restless, and uncomfortable. But in variola confluens, the fever is intense and perilous; the pulse is weak and rapid, the tongue brown and dry, there is great prostration, general tremors, coldness of the extremities, collapse of the features, and delirium. Occasionally the fever proves fatal at once, the system appearing to be overwhelmed by the virulence of the poison. In all cases the greatest care and the most attentive nursing will be required. Should any complications arise, such as erysipelas, phlebitis, pneumonia, inflammation of the urinary organs, ophthalmia, &c., the danger will of course be very much increased.

Diagnosis.—Like many other diseases, when once it is fully developed there cannot be much difficulty in the diagnosis, especially if the case be a severe one; but in the milder forms, and in the earlier stages, there is often room for doubt and occasion for a mistake. If there be any epidemic of small-pox in the neighbourhood, the case at once assumes a suspicious aspect, even in its earliest symptoms. In general, the doubt will be as to whether the case be one of small-pox, measles, or scarlatina. In reference to these it will be observed, that the vomiting is usually much more severe and more protracted in the former than in either of the latter, but there is absence of catarrhal symptoms characteristic of measles, and of sore throat which characterizes scarlatina. The severe backache which is so common in the variola of adults is wanting in children. Convulsions are not infrequent in the beginning of scarlatina, and are occasionally present in measles, but very seldom in small-pox. Then, as regards the rash, the difference is most marked: in small-pox it is distinctly papular from the first, and soon becomes vesicular, and *umbilicated:* nothing of the kind occurs with either of the others. Of course, as the disease advances, these diversities in the character of the several eruptions are still more observable, but by this time no doubt can exist as to the nature of the case.

Prognosis.—This disease is seldom fatal to young people between seven and fourteen years of age: it is, however, very dangerous to infants and delicate children. The more confluent the eruption, the greater the danger; and the more perfect the maturation of the pustules on the fourth day, the less the danger. The more abundant the eruption, the greater the danger: although, at the same time, as the pustules eliminate the morbid poison existing in the blood, and are thus essential to the cure, yet their quantity also indicates the extent to which the blood has been poisoned, and is consequently in a certain rough way a test and measure of the danger to life. Of those who die, nearly one-half do so between the seventh and eleventh days of the eruption. Delirium, a suppression of the perspiration, scanty urine, hæmaturia, great hoarseness, a sudden suppression of diarrhœa when present, are all dangerous symptoms: and further, the formation of abscesses or sloughing sores, the occurrence of convulsions, of erysipelas, or of other complications, are circumstances which increase the probability of a fatal termination.

Treatment.—In the treatment of small-pox, as of the other eruptive fevers, the practitioner must not attempt too much; and especially must he endeavour to aid, and not to thwart, Nature. There are three principal rules which should always be borne in mind:—1. To moderate the fever, when it is violent, by salines, mild laxatives, cooling drinks, and cold or tepid sponging. 2. To support the vital powers when they flag, by so-called stimulants, nourishing broths, and milk. 3. To combat any complications that arise with great caution; remembering that antiphlogistic remedies are badly borne by a system already prostrated by a debilitating blood poison.

Distinct small-pox requires but little treatment; and if the young patient is doing well, no medicine whatever should be given, notwithstanding the wishes of the parents or nurses to the contrary. We say this, because a popular belief still exists in many quarters, that drugs can cut short this affection; and that at any rate we ought to *do something.* But a wise practitioner will be contented with merely ordering a plain, unstimulating regimen; he will watch the child to detect any complications which may arise as early as possible; he will direct the sick-room to be kept cool, and the bed-linen to be light and often changed, treating the patient in this way very differently to what was formerly the rule when no fresh air was allowed to come near him for days, and when he was kept smothered almost with heavy and hot clothing. If thirst is complained of, plenty of water, or milk and water, or lemonade, or the juice of ripe subacid fruits may be given with advantage. But supposing the case does not proceed as favourably as could be wished, the prominent symptoms must then claim attention. Thus, if the bowels are confined, mild vegetable purgatives may be administered; when there is great heat of skin, the surface should be sponged every three or four hours with tepid or cold water, and effervescing salines or soda-water should be freely given; where there is great irritability, opiates in very small doses sometimes act beneficially: Dover's powder is perhaps the best form in which to give an opiate; when the throat is affected, emetics and gargles of sulphate of zinc —gr. 5 to water fl. oz. 1—or of the compound infusion of roses, will afford relief. Should the maturation of the pustules go on tardily, good broths and a little wine and water, or ammonia in camphor mixture, will be called for; at the same time the condition of all the internal organs must be carefully looked to.

In treating the secondary fever we ought first to attend to the bowels; if there be much irritability sedatives may be given: the system should be supported by a nourishing but digestible diet, such as strong beef-tea, milk, the yolk of one or two eggs daily, &c. Sloughy and gangrenous sores will best be treated by the application of poultices or fomentations; by the liberal administration of wine and brandy, or cordial medicines; and when they occur on the back or nates, the patient should be placed on a water bed, or on one of Hooper's large water-pillows.

Occasionally much inconvenience and distress and even injury arises from the eyelids becoming very inflamed, a good deal of matter is secreted, and the edges of the lids are glued together as it were, so that the eyes can hardly be opened. This state of things will be greatly relieved by frequent sponging with warm water, and by the occasional use of an astringent collyrium.

With regard to the prevention of pitting, several means have been recommended, though from our own experience we doubt if any of these are entitled to much confidence. The agent which we have found most successful for this purpose is the calamine cerate; it certainly can do no harm at all events, and when freely applied it has on several occasions seemed to answer very well. Further evidence is wanted as to the utility of covering the face with gold-leaf or with collodion, or with mercurial ointment, or with a solution of corrosive sublimate, or with the tincture of iodine, or with a strong solution of nitrate of silver; all these and many others have been vaunted at various times as remedies of great value for this particular purpose, but though we have tried some of them the results have certainly not been very encouraging. To relieve the intolerable itching of the pustules, they may be smeared with the calamine cerate diluted with olive oil, or with cold cream, or, what is better, with the carron oil. Further, when the pustules have burst, some dry powder, such as the oxide of zinc, or powdered starch, should be freely applied, to absorb the matter. Fra Salute has found, that a powder of four parts of flowers of sulphur and one part of red precipitate, dusted on a slight layer of glycerine previously spread on the pustules which have maturated, has prevented the formation of evident cicatrices on the face.

We stated that one of the three rules, which require especially to be observed, is to support the patient's vital power. This ought particularly to be borne in mind in cases of the confluent variety, and pre-eminently so during the maturation of the pustules, for it is just at this time that sudden prostration and collapse are likely to ensue. Against this danger the greatest care and watchfulness are required, and if at any time the pulse becomes quicker and feebler, the surface pallid, and the pustules assume a flabby, half empty appearance, if at the same time there be increased restlessness and delirium, then we must push our alcoholic remedies with increased vigour. This rule applies not to any one period but throughout the course of the disease, and notably also wherever symptoms of a typhoid character set in.

Lastly, as regards the complications which may arise in the course of small-pox, these are to be met and treated much in the same way as if they occurred under ordinary circumstances; always remembering, however, that in the existing state of blood poisoning the patient's condition is essentially adynamic, and should be treated accordingly.

Varicella, or Chicken-pox.

Varicella, or chicken-pox, is a comparatively trifling complaint, almost peculiar to infants and young children. Some authorities hold that this is not a distinct disease but a kind of modified small-pox, in which all the symptoms are extremely mild, and hence the term varicella. It is, however, certain that varicella often occurs in those who have had variola; that, moreover, it occurs where there is no variola about; and that not only is it unaccompanied by any of the symptoms which characterize ordinary small-pox, even in its milder forms, but in its results also it differs entirely from that disease. From the fact of the eruption assuming the form of opalescent vesicles, resembling glass beads, this affection has been popularly termed the "glass-pox."

As regards the *Symptoms*, it may be noted that after a short incubation—probably of four days—an eruption of transparent vesicles appears. In the course of a day the contents of the vesicles become uniformly opalescent, and a faint areolar appears. The eruption ordinarily commences on the shoulders and breast, affects the scalp, sometimes spares the face, rarely appears on the lower extremities, and is accompanied by slight pyrexia. Dr. Gregory states that when the vesicles are abundant, the body presents the appearance of having been exposed to a momentary shower of boiling water, each drop of which has produced a small blister. The vesicles seldom or never assume a confluent form, and thus it differs from small-pox even as regards its one leading feature —the eruption—moreover, there is never any of what may be called the papular stage, it rises at once into vesicles, and is unaccompanied by any constitutional disturbance; sometimes, indeed, there are literally no symptoms whatever beyond the rash; the child does not feel ill, has no fever, and in the course of about five or six days the eruption fades away and leaves no mark of its occurrence. Sometimes the eruption reappears after having died away, or rather fresh vesicles appear as the old ones fade, and this may go on for some time, showing still more strongly its dissimilarity to small-pox.

There are, however, occasional, though rare, exceptions to this rule; where the child is more or less ill for a day or two, with some febrile disturbance, sickness, quick pulse, and hot skin; after one, two, three, or more days the rash appears rather freely scattered over the body, the vesicles having a more than ordinarily inflamed base; but there is no central depression, no black spot on the scab when the vesicle dries up, and no pitting generally after its disappearance.

Little need be said in regard to *Treatment*, for next to nothing is required; the disease is so innocuous in itself, it runs such a simple course, leads to no complications, and gives rise to so few symptoms, that beyond guarding against cold, securing regular daily and proper action of the bowels, and preventing the child from scratching or irritating the skin when the vesicles dry and scab over, no other precaution need be taken, and certainly no medicine is required.

Rheumatism.

There are several distinct diseases included under the above name; we shall, however, only refer to the acute articular affection. The pathological cause of acute Articular Rheumatism, or Rheumatic Fever, is generally supposed to be an excess of lactic acid in the blood, an ingredient of one of the ordinary excretions. The predisposing causes are: hereditary disease, adult life, ill-health, previous attacks, and sudden changes of temperature. There may be no definite cause, but generally the disease is brought on by a sudden chill, produced by exposure to the cold, or wet, or to draughts when perspiring, or to wearing wet clothes. Sleeping in a damp bed is a common cause. It may be induced by scarlatina.

Post-mortem Appearances.—The morbid changes produced by rheumatism are principally apparent in the fibrous, fibro-serous, or synovial tissues. The joints are in a state of acute inflammation; the synovial membrane is vascular, thickened, and relaxed; and sometimes there is a deposit of lymph or effusion of fluid into the joints. Suppuration may occur in them, and the cartilages be destroyed. The muscles are usually dark, soft and infiltrated. There may be also evidences of pericarditis, endocarditis, or myocarditis, fibrinous vegetations in the heart, pleurisy, pneumonia, &c. The blood becomes buffed and cupped during coagulation, and is hyperinotic.

Symptoms.—The invasion of the disease may be gradual, but it is commonly ushered in by chills, followed by fever, and subsequently by implication of the joints and other structures. When it is established, there is restlessness and weariness; pain on movement; and at times helplessness; the body is bathed in a profuse, sour-smelling perspiration; sudamina are present; the temperature ranges from 100° to 104°, with evening exacerbations; the pulse is fast and strong; the tongue is coated; there is much thirst, inappetency, and constipation; the urine is scanty and deposits lithates; owing to pain, sleep is disturbed or cannot be obtained; the joints are specially painful and stiff, red, swollen, and hot; the pain is increased at night, and is of a dull and aching character. All the symptoms may be modified according to the severity of the attack. In some cases there are no joint symptoms. At times, a condition of *hyperpyrexia* is observed. The temperature suddenly rises, severe symptoms set in, and death speedily follows. The thermometer may register 110° or more, and may continue to rise even after death.

Complications.—No matter how slight the attack of rheumatism may be, we should always be specially on the alert for the onset of cardiac and pulmonary complications, since rheumatic inflammation may attack the heart, and extend before the occurrence of pain and swelling of the joints.

Prognosis.—This is generally favourable. The sources of danger are, a very high and sustained temperature, severe nervous symptoms, cardiac and pulmonary complications, adynamea, and associated chorea.

Treatment.—The patient must be clothed in flannel, and lie between blankets, all the joints are to be wrapped in cotton-wool and the wool changed as necessary. The diet should consist of beef-tea and milk. Ice, barley-water, and lemonade are useful in quenching the thirst. In case of much prostration, stimulation is indicated. The bowels should be regulated. As regards internal remedies, authorities differ. Some adopt the alkaline treatment, giving the preparations of potash and soda; others rely on lemon juice—the acid treatment; others on the vegetable and ferruginous tonics, quinine and tincture of steel especially; whilst others carry out an expectancy treatment, only giving drugs when complications arise. Opium or morphia should be given to allay pain and procure sleep. Aconite, digitalis, and veratrum viride diminish the tendency to cardiac inflammation. If the joints are very painful, they may be relieved by warm anodyne fomentations. Putting them into splints and bandaging them has been found very efficacious. Blistering is recommended in persons of advanced life.

In cases of hyperpyrexia, the patient must be put into a tepid bath, and the water gradually cooled by ice until the body temperature has fallen considerably. He should then be dried and put into bed, and hot water bottles placed at his feet. Brandy and beef-tea should be administered, if necessary, during the cooling process, but especially after the bath. The bath is to be repeated as soon as the temperature again rises. Quinine in full doses and free stimulation are essential to recovery. Every care is necessary in all cases during convalescence to guard against another attack. The diet should be improved gradually.

CHAPTER II.

THE DIATHETIC DISEASES.

GENERAL REMARKS.—Any one who would treat successfully the diseases of early life must make himself thoroughly master of what we may call the great landmarks of the pathology of childhood—viz., the constitutional or diathetic diseases or tendencies. It is probably not an exaggeration to say that nine-tenths of the children we are called upon to treat exhibit in some form or other unmistakable evidence of a diathetic taint, and it is, moreover, certain that these diatheses give a character to all other diseases, influencing their pathological tendencies, controlling and modifying the symptoms, requiring much vigilant watching, and necessitating distinct recognition in their management and treatment.

It is remarkable how much confusion seems still to exist in the minds of practitioners, and even in the writings of many authorities, as to the similarity or identity of some of these conditions; though they are, indeed, entirely distinct in their external characters, in their pathological tendencies, and in their therapeutical indications. Some writers, for instance, still regard tuberculosis and scrofula or struma as identical diseases, and they make use of the terms almost as if they were synonymous. Yet, we will venture to say, that not only are they not identical, but in many respects they are absolutely dissimilar, and to some extent even antagonistic. Rachitis again is frequently spoken of as though it was a sort of scrofulous manifestation; but the two diseases have no necessary connection, either may exist without the other, and, though they are probably often associated, they certainly are not identical.

We owe more, perhaps, to Sir W. Jenner than to any one else for clearly marking out the distinctive features of these diathetic diseases, and our own experience so entirely agrees with these observations in the *Lectures on Rickets* delivered by him at the Children's Hospital, and published in the *Medical Times and Gazette* for 1859, that we shall quote freely from them in the following pages.

We cannot too strongly impress upon the student the importance of carefully studying these diatheses, they are at the root of most of the diseases of children, and though they may in some cases remain for awhile, as it were, in a latent state so long as the child preserves a fair standard of health, they are pretty sure to be developed so soon as any acute illness supervenes. It is on this account that we so earnestly advocate the supporting plan of treating the acute diseases of childhood, and are so opposed to a lowering system of therapeutics, for undoubtedly the best safeguard against the development of diathetic disease is the maintenance of the child's strength. This view was strongly urged in a paper published by the writer in the *London Medical Review* for April, 1863, and we have had ample opportunities since of confirming that opinion: we are therefore fully convinced of the truth of what we then wrote; "that a very large proportion of the deaths which occur in early life, especially in acute diseases, are due mainly to some diathetic influence. Doubtless there are cases in which acute inflammation of some vital part speedily cuts short life in those previously healthy, but the more this question is inquired into the more frequently will it be noticed that the interference, if one may so say, with the natural progress of the disease by constitutional peculiarity (*i.e.* diathesis), is the great cause of death."

Now a diathesis may be either hereditary or acquired, but as regards their effects, there is no difference between these two causes; the results are the same, and they have the same pathological affinities. It is, however, of the utmost importance that we should recognize the fact of the possible development of a diathesis even in a child hitherto perfectly free from any such taint, because as we shall see, it may be in our power, in treating acute disease in children, to avert such a calamity. It cannot be doubted that a debilitated condition of the body is the most fertile soil, so to say, in which to develop diathetic disease. This was the burden of the paper just referred to: suppose, for instance, that a child in perfect health is severely attacked with measles, he is fed perhaps on a low slop diet, and gets about one-half the amount of nourishment accorded to him in health, though now he has more need of strength to resist the evil that threatens him; in addition to this he is dosed with drugs of a depressing character, such as are recommended by some authorities; his catarrhal symptoms are met with nauseating doses of antimony, ipecacuanha, mindererus, nitre, and the like. What is the result? He gets weaker and weaker, bronchitis of a low chronic character continues, he is further nauseated with emetic remedies, and finally, when it is too late, it is discovered that tubercles are forming and being deposited; or strumous glandular enlargements are taking place; or his osseous system is more especially affected, and whereas before the attack he could run and play about, now he is unable to stand alone, he droops his head, his back becomes curved, and he crawls about on "all fours," a helpless, rickety child. If, on the contrary, such a child had been properly fed, and his strength supported by alcoholic food and a generally tonic plan of treatment, the disease would almost certainly have run a much shorter course, and the diathetic development would have been averted. Now, if such principles should guide us when a diathesis is anticipated, how much more ought they to influence us when such is known to exist? We cannot then be too careful, and we shall best guard against these evils by being fully alive to all the indications of the diathetic taint, and by an intimate acquaintance with the peculiar morbid tendencies which such taints are likely to exhibit.

There are four distinct types of diathesis—viz., the scrofulous, the tubercular, the rickety, and the syphilitic; so distinct are these in their external aspects, their physiological characteristics, and their pathological tendencies, that they seldom co-exist in the same individual; indeed, from our own experience we believe that some of them have directly antagonistic influences, and cannot therefore operate in the same organism—for instance, the tubercular and the strumous we have never yet seen associated, and it is exceedingly rare to find a clear case of rickets combined with tuberculosis. Of course the syphilitic may occur with either of the other three, though in our experience it is more commonly associated with the strumous variety; while the rickety and the strumous seem to have a less distant relationship, though even these are more often met with separately.

Another point which shows the importance of a knowledge of these diatheses is this, that we can, knowing the peculiar pathological affinities of each, predicate with tolerable accuracy what course any given case of acute disease is likely to take. For instance, in a strumous child, inflammation of cellular tissue is much more likely to end in suppuration and abscess than in a tubercular subject, and this applies in a measure to all inflammations in strumous children; while, in a tubercular child, the copious deposition of lymph is the distinguishing feature in its inflammations. The rickety again resembles very closely in this respect the strumous; while the syphilitic has characters peculiar to itself, which we shall presently describe. Moreover, the strumous child is more liable to inflammations of the mucous surfaces and of the lymphatic glands, while the tuberculous child is subject to serous inflammations and seldom has any glandular diseases.

We have now said sufficient we think to show that great differences exist in these several diatheses, and that they have important clinical bearings, which will be still further apparent when each is studied separately.

I. THE SCROFULOUS DIATHESIS.

General Characters.—Children in whom the scrofulous diathesis is fairly marked will generally be found to present the following characteristics; they are for the most part, though not invariably, of pale complexion, with fair hair, which is frequently long, thick, and somewhat coarse; the skin is generally thick and not very clear, the expression more or less dull and heavy, the face round, plump, and rather flabby, but the cheeks rosy and fresh looking, with too much rather than too little colour; the lips are thick, especially the upper one; the teeth white, but soon decaying; the nose large, the alæ thick, and the nostrils open; the eyes are large and full, usually pale, with dilated pupils; the lower jaw is broad and large, the abdomen also large, and has a feeling of fulness and hardness; the lymphatic glands are generally much enlarged, the bones are thick, especially the ends of the long bones; the whole body is gross and dull looking, the flesh soft, flabby, and cold, the temperament phlegmatic, and the intellectual powers are seldom of the highest order, generally very much the reverse, notwithstanding the relatively large size of the head.

Scrofulous children are remarkable for the abundant secretion of their mucous surfaces; their eyes are often weak, with an evident tendency to ophthalmia, and that too of a kind so peculiar as to have received the specific name of "strumous:" there is a free discharge from the nose—scrofulous ozœna—as well as from the entire pulmonary surface, and they are peculiarly liable to a kind of mucous diarrhœa; though, at the same time, from their generally torpid character, they are prone to constipation; otorrhœa is also a frequent complication, and purulent or muco-purulent discharges from the vulva or vagina of young girls.

Causes.—The causes which have been most frequently assigned are, hereditary influence, syphilis, bad air, bad food, and a cold and damp atmosphere. As regards hereditary influence, it may be doubted whether there is any poison or strumous virus which is capable of being transmitted from parents to their children, but, on the other hand, there can be no doubt that the children of scrofulous parents are more liable to have the disease developed in them than the children of healthy parents: this was the opinion of John Hunter, and there is little doubt of its substantial accuracy. On the other hand, it is equally certain that the disease is not contagious.

Many authors have imagined that a syphilitic taint in either parent will induce scrofula in their offspring; while some have maintained that the disease is only a degenerated species of syphilis. There seems, however, to be no truth in either of these suppositions; scrofula and syphilis being very different diseases, quite independent the one of the other. Neither does the development of struma appear to be influenced by climate or temperature, though it is true that a damp atmosphere appears to exercise a very prejudicial effect on scrofulous subjects. But it is to diseased nutrition chiefly, however brought about, that we may refer the production of scrofula; and it is to insufficient or improper food, that the vast majority of cases of diseased nutrition are due, though it may also arise from breathing a vitiated atmosphere, or from want of cleanliness and healthy exercise.

Prevention.—There are four points to be attended to in the prevention of scrofula, two of these have reference to the parents, the others to the children. In the first place, though this is a matter which scarcely falls within our province, and is seldom subject to our advice, yet it is most important to obtain well-assorted marriages—that is, the marriages of parties in sound health and vigour.

Secondly, where this disease exists in either or both of the parents, great care should be taken to maintain the health of the mother during the period of utero-gestation. She should wear warm clothing, take regular exercise in the open air, avoid heated rooms and late hours, and have a plain nourishing diet. With regard to the child, every means should be taken to maintain its general health, and to counteract the hereditary influence by attention to the food, air, clothing, &c. If the mother be free from strumous habit she may suckle her offspring, but if otherwise, a young and healthy nurse should supply her place in this respect. At the age of nine or ten months the child should be weaned, after which he should be fed on cow's milk, with a small quantity of light nutritious vegetable food—such as arrowroot or corn-flour—and a little broth may be given on alternate days. Dr. Paris strongly recommended milk impregnated with the fat of mutton suet, which he ordered to be prepared by enclosing the suet in a muslin bag, and then simmering it with the milk. The child should be warmly clothed, should live in apartments where the ventilation is good, have plenty of exercise in the open air, and once daily should have a cold sea-water bath, or a cold bath with bay-salt dissolved in it. Lastly, in cases where there is no hereditary predisposition, ill-ventilated and damp houses should be most carefully avoided; as well as localities which are generally regarded as unhealthy; for the rest, the observations which we have made in our general remarks on the diathetic diseases are especially applicable to this form.

We have already alluded briefly to the special *Pathological tendencies* exhibited by scrofulous subjects. They are peculiarly prone to inflammations of a low type, with a marked disposition to suppuration, and this with special reference to the mucous surfaces, pulmonary and gastro-intestinal. In their cutaneous diseases also, the formation of pus is a characteristic of the scrofulous habit, hence vesicular and pustular eruptions are most common, presenting thus a marked contrast to the tubercular diathesis, which is characterized by the occurrence of papular or neurotic eruptions. The eyes of scrofulous children are also liable to a specific form of ophthalmia which is peculiar to this diathesis, and is characterized by great intolerance of light, pain, and a profuse watery or purulent discharge. Diseases of bones, with caries and necrosis, and diseases of the structures about joints, especially the synovial membranes, and the medullary structure of bones, are also very common in the scrofulous constitution. Lastly, the lymphatic glands are liable to inflammation and suppuration on very slight provocative causes: this appears to arise from the glands becoming the seat of a peculiar deposit, which readily takes on a low form of inflammatory action.

Treatment.—An account of the superstitious practices—touch of the dead felon's hand, the drinking out of human skulls, the various pilgrimages, and the Royal touch—all of which were formerly performed for the cure of scrofula, would form a curious chapter in the history of human credulity, but would be out of place in these pages; we shall therefore confine our attention to those agents which are most commonly employed, and are well deserving of attention, such as the various preparations of iodine, cod-liver oil, the muriates of baryta and lime, &c. Mercury, in all its forms, was formerly administered in cases of scrofula; it certainly does not, however, possess any peculiar property for removing this disease; and when administered so as to lower the general powers, whether by profuse purging or by salivation, does much mischief. When combined with other medicines in small occasional doses, as an alterative, it is often beneficial, especially in the form of perchloride, in small doses —such as the $\frac{1}{60}$th or $\frac{1}{30}$th of a grain twice daily, with the extract and decoction of sarsaparilla.—Vide Formulæ; *Alteratives.* Iodine is by some regarded as little less than a specific, and it certainly is a remedy of great value. The iodide of potassium in moderate doses is the best and most extensively used preparation; or the liquor potassii iodidi compositus of the old London Pharmacopœia, in doses of half a drachm to a drachm—according to the child's age—may be employed. The use of the iodo-bromated mineral waters, especially those of Kreuznach, and of the Woodhall Spa in Lincolnshire, is often attended with the best results. The latter water is exceedingly valuable in all forms of scrofulous disease. When applied externally, as an ointment or as a paint, to enlarged glands, &c., iodine is very useful. Lugol also recommends the application of iodine and its compounds in the form of baths; and when associated with iron or quinine or zinc, its efficacy is in some instances increased. Cod-liver oil (oleum morrhuæ) will often do good in improving the nutrition of strumous patients. It requires to be given for some time, commencing with half a drachm thrice daily, and gradually increasing it up to two drachms or more.

The muriates of baryta and lime have been much extolled, but on insufficient grounds; and they are now rarely or never used. The whole class of tonic medicines have been recommended; and there is no doubt that quinine, steel, and the mineral acids will occasionally be found very useful.

For further information regarding the different manifestations of scrofula according as it affects particular organs, the reader is referred to the several chapters which treat of the organs in question. The object of this section is merely to point out the general features of the diathesis, and to show by its special pathological affinities in what way it is likely to influence other morbid states.

II. THE TUBERCULAR DIATHESIS.

General Characters.—The principal characteristics of the tubercular diathesis are in many respects the direct opposite of those we have described as belonging to the strumous; for instance, children so constituted are more often dark than fair, the hair is exceedingly fine and glossy, not over-abundant; the skin is very thin, clear, transparent, and highly sensitive, the veins often shining through and giving it a bluish tint, sometimes, according to Dr. Gee, though we have not been able to verify this ourselves, the face is very much freckled, and he believes that in London at all events this sign is of great value. The expression is usually bright, quick, and sharp; the face somewhat conical and long, the apex of the cone being formed by the chin, it is often pale, and the lips are thin and disposed to be florid; nose sharp and long, alæ of nose contracted; eyes bright, frequently dark, and pupils often widely dilated; the lower jaw is small and angular; the body generally slight, deficient in fat; the bones fine and hard, ends of the long bones small; the limbs straight and thin, the abdomen is small and contracted; the lymphatic glands can sometimes, but not always, be felt, and are generally small and hard, feeling like shot under the fingers. Ossification, including dentition, is usually developed early, the first teeth appearing often by the end of the fifth or sixth month, the nervous system is exceedingly sensitive, the temperament intellectual, and there is a marked preponderance of nervous phenomena, the child being usually in advance of his years.

Causes.—The principal cause of the tubercular diathesis is undoubtedly hereditary influence. Few facts are better established in pathology than the hereditary character of tuberculosis. But the disease may also be acquired, and, on the other hand, children may be born of decidedly tuberculous parents, yet, though possessing some of the characters of this diathesis, the disease itself may never be fully established. Much in this respect will depend upon the management of the child, and especially on the treatment he receives during any acute disease, for should his vital powers be diminished, or any depressing system of therapeutics be adopted, it is almost certain that the latent tendency to tuberculosis will speedily show itself. Indeed, however well managed in this and other respects, it is more than likely that such a result would follow in the course of any severe inflammation, or during the progress of fever. Good hygienic management may however avert this tendency during the period of childhood, and after that the chances are largely in favour of its non-appearance.

But the tubercular diathesis may be acquired without any hereditary influence: the chief causes being all those varying circumstances connected with childhood which interfere with the proper nutrition and development of the body, such as improper or, what comes to the same thing, insufficient, food, impure air, cold and damp atmosphere, and unhealthy situations. Besides these, certain diseases may also determine tuberculosis when by their chronic character they gradually exhaust the vital powers; this happens in the case of chronic bronchitis after measles, in obstinate whooping-cough, in low febrile conditions, in pneumonia occasionally, in chronic diarrhœa such as sometimes accompanies dentition—in short, it may supervene on any disease which undermines the child's strength.

From recent observations and experiments by Drs. Wilson Fox, Andrew Clark, and others, it seems probable that a disease having at any rate most of the external characters of tuberculosis may be produced by direct inoculations either with tubercular matter or with some non-tubercular material. The question is, however, interesting rather pathologically than clinically, and need not be considered further in this place, as at present, at all events, it does not possess any practical interest.

The *Symptoms* of the tubercular diathesis are in the main to be found in those general characters which we have already detailed, and if any good is to be done in the way of treatment it must be through the recognition of those symptoms; of course as the disease develops in particular organs, other symptoms of an acute or chronic character may arise, and they will for the most part take their shape according to the organ affected. Previous to this, and while the mischief is, as it were, latent, the child gives indications of failing health, he loses flesh and colour, his muscles become flabby, and he is listless, dull, and peevish, without either spirit or energy; at night time he is often thirsty and somewhat feverish, with a quick pulse, and a dry hot skin: sometimes the temperature will rise to as high as 105° and upwards at night, at other times, and within a few hours, it will fall to 98°. This comparatively sudden and causeless rise and fall in temperature, with other feverish indications, always attracts attention and ought to excite suspicion. When this occurs, the appetite fails, the tongue is foul, the breath often offensive, and the bowels disturbed by mucous evacuations, now very much relaxed, now confined, but in either case the evacuations are fetid and usually pale. There may then be slight cough, with hurried respiration, or symptoms of catarrh may arise, and henceforward, when the general symptoms have become so marked, and when further there are present the peculiar outward manifestations of the diathetic state which we have already described, the disease is pretty sure soon to attack some one organ, and then the symptoms will point directly to it; it may be the head, the chest, or the intestinal canal. A peculiar, almost harsh dryness of the palms of the hands and soles of the feet is a very common symptom.

There are some peculiarities in the shape of the chest in tubercular subjects to which it may be well here to allude, in order that by their recognition we may be upon our guard against what they indicate. They were, we believe, first pointed out by Sir William Jenner, and all were by him ascribed to the smallness of the lung, which there is no doubt very commonly exists in tuberculous children:—1. The long, almost circular, thorax. 2. The long thorax, with narrow antero-posterior diameter. 3. The long pigeon-breasted thorax. The two former are produced by gradually increasing obliquity of the ribs from the shrinking of the lungs, the first four intercostal spaces are widened, the last four narrowed, and the junction of the four middle ribs with their corresponding cartilages is marked by an acute angle, "the ribs passing downwards, the cartilages upwards," thus, though the thorax is a good deal lengthened, its capacity is diminished. The third variety of thorax is brought about by frequent attacks of catarrh or bronchitis, and it differs from the pigeon-breast of rickets in this respect, that in the former the deformity in question is limited to the lower part of the chest, while the upper part is rather flattened: in the latter (the rickety) the deformity extends as high as the second rib.

As regards *Diagnosis*, this is not generally a matter of much difficulty, at least not in the more chronic forms, if the case be carefully watched ; but it is often extremely difficult to diagnose a case at first sight unless the general aspect of the child is well and distinctively marked. In the acute variety the symptoms are very apt to be mistaken for those of fever, and the diagnosis is proportionally difficult. In the chronic form of tuberculosis we should probably find most of the characteristics above detailed, and our opinion would be materially influenced by the previous history of the child and of his family. Steady decline in strength and vigour, loss of flesh and appetite, irregular attacks of feverishness, and, above all, as Dr. Ringer has pointed out, a persistent rise of temperature, these, in conjunction with the points before mentioned, would afford very strong presumptive evidence of the disease in question. In reference to temperature Dr. Ringer goes so far as to say, that "there is probably a continued elevation of the temperature of the body in all cases in which a deposition of tubercle is taking place in any of its organs ;" and he adds, that " the temperature may be taken as a measure of the amount of tuberculosis and tuberculization." Our own experience, corroborated by Sir William Jenner, however, does not warrant this belief. We have occasionally observed a rapid deposition of tubercle without any rise of temperature to mark its progress. In any recent case, where the symptoms we have mentioned have not had time to develop, it will be better not to give a positive opinion, but to watch the case for awhile, and gradually, with a rapidity in proportion to the severity of the case, features will come out which do not admit of much doubt, even though there be no particular localization of the disease.

As in the case of scrofulosis so in tuberculosis, there are peculiarities of *Pathological tendencies* which mark this diathesis and which it is important that we should know, both in regard to diagnosis and treatment. Thus, inflammation of the serous surfaces are common in tuberculosis, of the mucous in scrofula. The effusions of lymph and serum is common in the former, suppuration in the latter. Papular and neurotic skin affections occur very frequently in the tubercular diathesis; vesicular, and, still more, pustular eruptions characterize scrofulosis. But further, fatty degeneration attacks the liver and kidney in tubercular children, and a peculiar deposit, tubercle, occurs in the various organs of the body, more especially in the lungs, bronchial, mesenteric, and lymphatic glands, brain or meninges, intestines, liver, spleen, peritoneum, kidneys, and supra-renal capsules, pleura, larynx, stomach, spinal cord and skin. These several parts are enumerated in the order in which they are most frequently involved. The skin is placed last, but there is reason for believing that tubercle in the skin is not nearly so uncommon as is supposed, the disease, being, in fact, often overlooked, or mistaken for some other deposit; when, however, it does occur, it is always an indication of a very severe constitutional taint, and should excite the gravest anxiety: it seems to be most frequent in very young children.

A complete description of the *Morbid anatomy* of tuberculosis would occupy more space than we can afford, or than is necessary, in a work of this kind; but we may state briefly that the deposit which is the distinguishing feature of this disease is of two kinds—viz., grey and yellow tubercle. By some it is supposed that these two varieties merely represent two stages of the same disease. Rokitansky maintains that they are always different substances; and that although they often co-exist in the same lung, yet that they never become transformed the one into the other. More recent observation, however, tends rather to the opposite view, and to prove that the grey granulations are those which are at first deposited, that these subsequently become whitish, and finally yellow, by a process of degeneration, for both of these varieties are not unfrequently found to co-exist in the same lung. The only, or rather the chief, difference between these two deposits appears to be in the amount of fat which they contain, and which is much greater in the yellow than in the grey variety. Sometimes we may meet with specimens in which the process of transformation from the grey to the yellow is actually visible, the yellow spot beginning in the centre of the granulation, and gradually extending till the colour is completely changed from grey to yellow. Certainly this change occurs sometimes, though it may not do so in all. When the tubercle softens the change begins usually in the centre: but sometimes the opposite of this occurs, the animal or organic parts are absorbed, shrinking takes place, earthy matter is deposited or is left after the absorption of the organic material, and what is called cretification is the result—the tubercle being represented years afterwards by a little mass of chalky matter. Be this as it may, it is certain that the minute structures of both are essentially similar. When the deposit occurs in the lung it is at first in distinct and separate granulations, but these afterwards coalesce and form masses of various sizes, which subsequently undergo the processes of softening and breaking down.

Of course there has been a good deal of speculation as to the mode of formation or deposition and the nature of tubercle. Perhaps the best explanation, and that to which many authorities—as Lebert, Ancell, and Dr. John Hughes Bennett—subscribe, is that it consists of an exudation of the liquor sanguinis, presenting marked differences from the simple or inflammatory exudation on the one hand, and the cancerous exudation on the other. As the blood is of course dependent for its constitution on the results of the primary digestion in the alimentary canal, on the secondary digestion in the tissues, and on the healthy performance of the function of respiration, so we must agree with Dr. Bennett that the causes of the tubercular exudation are to be sought in the circumstances which operate on, or influence, those results. In his work *On the Pathology and Treatment of Pulmonary Tuberculosis,* he says—"The successive changes which occur for the purposes of assimilation in the healthy economy may be shortly enumerated as follows:—1st. Introduction into the stomach and alimentary canal of organic matter. 2nd. Its transformation by the process of digestion into albuminous and oily compounds: this process is chemical. 3rd. The imbibition of these through the mucous membrane in a fluid state, and their union in the termini of the villi and lacteals to form elementary molecules: this process is physical. 4th. The transformation of these, first into chyle corpuscles, and secondly, into those of the blood, through the agency of the lymphatic glandular system: which is a vital process. It is from this fluid, still further elaborated in numerous ways, that the nutritive materials of the tissues are derived; so that it must be evident if the first steps of the process are imperfectly performed the subsequent ones must also be interfered with. Hence we can readily comprehend how an improper quantity or quality of food, by diminishing the number of the elementary nutritive molecules, must impede nutrition."

From the chemical analysis of tubercle, it would appear to consist of animal matter—principally albumen, and certain earthy salts—chiefly the insoluble phosphate and carbonate of lime, and the soluble salts of soda.

In pulmonary phthisis, the tubercular deposit takes place in the areolar tissue between the air-cells, in the air-cells themselves, and in the smaller bronchial tubes communicating with them; and wherever a speck of this matter is deposited from the blood, it continues to increase by constant addition. In its hard state it is called crude tubercle: and it is in this condition that it is generally found in children dying of pulmonary consumption, cavities being comparatively rarely formed in the lungs in early life. After a time, inflammation arises in the pulmonary substance surrounding the deposit; suppuration occurs; the tubercular matter softens and breaks down, and at length is gradually expelled through the bronchi, trachea, and mouth, leaving cavities or excavations of various sizes. Sometimes these cavities close and heal; more frequently tubercular matter continues to be deposited on their sides, and in other parts of the lungs, until these organs become diseased to an extent incompatible with the continuance of life.

For the fuller consideration of the subject of tuberculosis, as affecting particular parts or organs, the reader is referred to the various Sections on *Phthisis, Tubercular Meningitis, Tabes Mesenterica,* &c. &c.

Now, as to *Treatment*. The management of the tubercular diseases of particular parts will be found detailed in the several chapters relating to those subjects, our remarks here will therefore have reference chiefly to the general or constitutional requirements of the tubercular diathesis, apart from any local development of it. And first of all it should be remembered, that much may be done by general hygienic management to prevent the disease manifesting itself. Of course children ought not to be nursed by tubercular mothers, and the utmost care will be necessary in the feeding and training of a child who is known to have a tubercular tendency. Mal-nutrition is so largely concerned in the causation of diathetic diseases, that we can only hope to avert them by the strictest attention to regimen in diet, clothing, and general habit of life. Above all, purity in the air respired, and freedom from dampness, are absolutely necessary, cold is of far less moment than dampness. Dr. Buchanan has shown that one form of tubercular deposition—viz., in the lungs—is very much more frequent in low and damp situations than in higher and drier regions, and Dr. Weber has recently adduced some evidence showing that removal to highly elevated localities is singularly advantageous in a therapeutical point of view.

Next to the providing of pure and dry air, a carefully regulated diet, moderate exercise and suitable clothing, it is of great importance to prevent anything like fatigue, and to avoid every tax upon the child's strength: to maintain the latter in an efficient state, some alcoholic food is, if not necessary, at least desirable, a little tent wine once or twice a day is generally borne well and does good service.

As regards medicines; one of the most important points to be attended to in the therapeutics of tuberculosis is the condition of the digestive organs. Generally these are exceedingly sensitive and very likely to be disordered. The most frequent state being one of relaxation. For this, the combination of sedatives, of which chlorodyne, the liquid extract of opium, and henbane, are the best, with alkalies; and, when there is much mucus in the evacuations, astringents, especially kino, krameria, and logwood; the compound chalk powder with opium, or the compound kino powder with opium, are valuable as combining all these three requisites. Further, notwithstanding the Report recently published as to the action of mercury, we must say that where the motions continue pale in colour, and too frequent, great benefit will result from the employment of a dose or two of grey powder.

As soon as the bowels are restored to a normal state, the remedy of greatest value is cod-liver oil, especially the etherized variety, and fortunately children take this not only without any difficulty, but often with apparent relish. It is of great importance to give this immediately after food, remembering that it is no part of the function of the stomach to digest fats, and that if oil be taken into an empty stomach it is very apt to remain there undigested and so to disagree: whereas if taken with food its digestion is partly effected by the aid of the salivary secretion, and is completed by that of the pancreas further on. Cream may be taken when the oil disagrees, and milk, bacon and fat things generally will do good. Dr. Fuller recommended sugar as of use in these cases, glycerine also has been advocated, especially by the late Dr. Todd, but, though we have often tried it, we cannot say that we have seen much good result from it. The pancreatic emulsion has also been strongly recommended, but we have had no experience of it. Dr. Buchanan, who is a most careful and accurate observer, has urged the use of the citrate of potash in tuberculosis affecting the lungs, and states that he has seen great and permanent benefit in the course of a very few weeks. Tonics are of course of signal service, and especially those of the chalybeate class, of which the citrate of iron and quinine, or the peracetate, are, perhaps, the best. Other remedies will be found detailed under the heads of the various tubercular diseases.

III. THE RACHITIC DIATHESIS.

The third form of diathesis which we have to consider is the rachitic; and, like the other two which we have already discussed, it is distinguished by certain external characteristics, and possesses some very clearly defined pathological tendencies.

General Characters.—Supposing the disease to be well established, one of the first things which strikes us in examining a rickety child is the condition of the osseous system as revealed by its outward form; this is observable both as regards the shape of the face, of the head, the chest, and the extremities, but especially of the lower limbs. The face is generally fat and plump, but broad, rather disposed to be square, particularly in the lower jaw; the head is somewhat large, flat, and square, and the superficial veins are very prominent. The anterior fontanelle may be large, but the sagittal suture is generally closed at the eighth or ninth month. The orbits are normal, and there is no prominence of the cornea. The difference in the shape of the face, and the condition of the cranial bones, in rickets and tuberculosis is very marked: in rickets the face is, as we have just said, more or less square and plump, the ossification of the cranial bones being so retarded that the fontanelles are often not closed even as late as the fourth year; while in tuberculosis the face is conical, very thin and pointed at its lower part, the ossification of the cranial bones being prematurely complete. The chest is usually somewhat flattened from back to front, wide from side to side, and having a deep groove on each side in front, from the first to the tenth rib, just where their cartilages join the ribs. Lastly, it will be noticed that the limbs, especially the lower pair, are more or less curved, either laterally or anteriorly, and the ends of these long bones are thickened. Occasionally the spine is more or less curved.

In addition to these peculiarities of outward form, rickety children are usually feeble both in muscular power and in mental capacity, and are generally wanting in vigour; they are short of stature, have a muddy pasty look and a thick skin, which is very often hairy. From the defect in the process of ossification, which is, indeed, the very essence of the disease, they cut their teeth late, and are a long time before they can either stand or walk.

Such are the more prominent characteristics of a well-marked case of rickets, but there are many other indications of the existence of this disease which we may note under the head of

Symptoms.—Considering that this affection, like the other diathetic diseases, has its origin in mal-nutrition, it will be anticipated that the earliest symptoms have reference to this as a cause, and though there may be, and usually are, the general indications of failing health, even as early as the sixth month, there is nothing distinctive about the symptoms at this period, the child is dull, languid, and without spirit, having but little appetite, a moderate degree of thirst, and a tendency to diarrhœa, the motions being extremely offensive and dirty looking, the flesh loses its tone and becomes flabby, the skin is muddy looking, and disposed to perspiration, which is very marked at night, especially as regards the head, and upper part of the trunk; in very decided cases this symptom immediately attracts attention, so excessive is the perspiration, that it literally streams off the child as he sleeps, while at the same time the lower part of the body and the lower limbs are hot and dry; nevertheless there is a varying fall in the evening temperature. At this time the child will constantly kick off the bed-clothes even in the depth of winter; and when lifted or moved about he seems to be in pain, for he cries on being touched and is apparently tender all over. It cannot sleep with its occiput resting on the pillow, in consequence of the suffering of this bone, it being the first to be attacked in this disease: in the nurse's arms, the child rests the head on her breast. When these symptoms assume a definite form, there can be little doubt in the mind of the observer as to what is the nature of the ailment; nor will he remain long in ignorance, for the indications of defective ossification are soon apparent. The teeth, for instance, appear very tardily, the first not being cut sometimes till the completion of the year, or even later, and the rest appearing at long intervals. The anterior fontanelle is wide open as late sometimes as the third year, and the bones of the chest and extremities are in the condition already described. There is a tendency to partial convulsions, especially spasm of the glottis.

The muscular power of the child is very much below par, indeed, to such an extent is this carried, that the little sufferer is reduced sometimes to a state of perfect helplessness, and this notwithstanding that the muscles appear to retain their normal size and form. Under the microscope, however, the muscular fibre is found to be pale, almost transparent, and structureless, but without any fatty degeneration being visible; this is the more remarkable because in some other diseases, as for instance in tuberculosis, the muscles may be so reduced as to be scarcely more than half their normal size, while at the same time the child is able to move about almost as actively as before.

In mental capacity the rickety child is far below the average, though he never presents any appearance of idiocy. "Their mental like their muscular power is not merely slowly developed, but it retrogrades as the rickety diathesis progresses. The general aspect of the rickety child is so peculiar, that when the crooked limbs, the large joints, and the deformed thorax are concealed, you may even detect its ailment at a glance. Its square face, its prominent forehead, its want of colour, its large staring and yet mild eyes, its placid expression, and its want of power to support itself, like other children of its age, on its mother's arm, all conspire to form a picture which has not its like in the gallery of sick children." (Jenner.)

We have said that, as a rule, the rickety child is plump and apparently well nourished, but in reality it is not so, for sometimes there is great emaciation. This is probably due to albuminoid infiltration of one or more organs: it may involve the entire lymphatic system; and the spleen, liver, kidneys, and brain are sometimes affected in the same manner. It is a point of importance to distinguish between superficial lymphatic glands which are affected with tubercular disease, and those that are met with in rachitis. The difference is usually very well marked: in the former the glands are hard, small, and round, about the size and shape of swan shot, rolling easily under the finger; in the latter they are less hard, larger, often two or three times as big as the tubercular gland, and less mobile.

The duration of the disease, as well as the date of its first appearance, vary greatly. M. Guerin divides the whole term into three periods—viz., *a*, the stage of incubation; *b*, the stage of deformation; and *c*, the stage of transition of the organs and functions to a healthy condition. Of 346 cases of rickets observed by this author, three are said to have arisen before birth, though the question of its being a congenital disease is much disputed, and is entirely disbelieved by the majority of English writers; 98 occurred in the first year, 176 in the second, 35 in the third, 19 in the fourth, 10 in the fifth, and 5 in the sixth: 148 were males and 198 females: the average period of incubation was six months, during which a marked train of deranged actions manifested themselves. The total duration of the disease, according to this observer, is from one to two or three years, or longer.

As regards *Diagnosis*, though this is sometimes difficult in the early or precursory stage of the disease, the symptoms very closely resembling, at least in some respects, those presented by tuberculosis in some of its various forms, yet the subsequent stages are characterized by symptoms which can hardly be mistaken; the deformities of the bones are alone sufficient to distinguish this from all other affections; indeed, there is none which could by any possibility be mistaken for it when once the disease is fairly established, and provided that the observer is conversant with its true nature and with the characteristic features which we have pointed out.

Prognosis.—When the case is uncomplicated, a favourite result may be reasonably expected from judicious treatment: but when there is great deformity, with considerable loss of vital power, recovery will be more than doubtful, and the earlier that the disorder occurs in infancy the more unfavourable is the result likely to be. The causes of death are, however, various. Thus, a fatal issue may result from a state of extreme cachexia, the child literally dying from exhaustion; or he may die from some one or more of the complications which attend upon the primary disease—for instance, from adhesion, albuminoid infiltration of the glandular system, including some of the larger glands, the spleen, liver, &c.; or death may occur from convulsions, from laryngismus stridulus, from chronic hydrocephalus, from diarrhœa, and lastly, and far more commonly than from all these, from bronchitis.

Causes.—Anything which induces imperfect assimilation of food and impaired nutrition of the body may act as a cause of rickets: hence this affection is sometimes met with among the weakly children of wealthy parents, as suffer from defective action of the vital forces. Like scrofula, however, it is a disease which occurs most commonly among the poorer classes, who are subject to insufficient, and especially to improper, food: moreover, the foul impure air which they breathe, and the damp, dark, cold, and filthy dwellings in which they live, all these and similar circumstances readily serve to generate it. But further, the children of parents who have weakened themselves by sexual excesses; those whose constitutions have been impaired by syphilis, by a strumous taint, or by unhealthy occupations; these are, beyond doubt, predisposed to the disease in question. It has also been shown by Dr. Tilbury Fox, that the children nursed by women who menstruate during lactation, are especially prone to rickets: we have not been able to confirm this observation, but it is certainly true that anything which interferes with the due performance of the functions of lactation, and therefore impairs the nutrition of the child, will be likely to induce rachitis.

A few words may here be introduced as to the *Pathology* of the disease. We have stated that it is essentially a disease of mal-nutrition, and that it affects principally, but by no means entirely, the osseous system; indeed, there is hardly any part of the body, in a case of confirmed rachitis, which is not more or less affected. As regards the bones, not only is there in them a deficiency of earthy matter, but, according to Lehmann and Marchand, the organic constituents are also changed; for the bones do not yield gelatine by boiling. It appears, too, that the deposition of earthy matter, such as it is, is misplaced, for it is found not in the matrix of the bone where it ought to be, but in the cartilage cells. Further, it does not seem that these changes are due to any deficiency of earthy salts in the system, for they are often in great abundance, but are not properly deposited, and sometimes are even re-absorbed from bones previously well formed, being carried out of the system again in the urine which becomes loaded with phosphate and carbonate of lime.

It is likely that some almost equally important changes in the constitution of the muscles exist, and are the cause of the extreme muscular weakness which is so characteristic of rachitis. In like manner, the changes in the glandular system are further evidence of the profound derangement of the nutritive processes. What may be the exact nature of that derangement, and how it is brought about, we do not know, for it may be due to either the nerves, the blood-vessels, the blood, or the tissues. Loschner asserts that rickets is to be regarded as a result of chronic intestinal catarrh. Monti s observations tend to the corroboration of this view.

Treatment. — The prophylactic treatment consists mainly in avoiding all interferences with healthy nutrition, residence in a healthy situation, warm but well-ventilated rooms, a carefully regulated diet, and suitable clothing, these are the chief points which require to be attended to in the way of prevention. When the disease is established, attempts must be made to check any complications—such as dyspepsia, diarrhœa, &c.—which may exhaust the system; at the same time everything should be done to strengthen the constitutional powers. Tepid chalybeate, or sea-water baths, or the tan bath, F. 77, as recommended by Dr. Elsässer, or daily sponging with salt water; pure air—especially sea or country air; good nourishing diet, with plenty of milk; ferruginous tonics, sometimes in combination with iodine: and cod-liver oil, taken continuously for many weeks or even months; are the remedies on which we may chiefly rely. Great benefit will be derived from gentle exercise in the open air, if the child is able to bear it, if not, he should be out in a carriage or Bath chair as often as the weather will permit.

In the matter of medicines, it must be borne in mind that we have no specific remedy for rachitis; none, for instance, which can compare with quinine in ague, or iodide of potassium in periostitis. The disease being one affecting the general health and nutrition of the child, general treatment, as it is called, will alone suffice in opposition to the theoretical exhibition of a particular drug to satisfy a favourite crotchet. In making this remark it will be understood that we allude more particularly to the employment of the salts of lime as a remedy for rachitis. M. Piorry, indeed, states that he has long been in the habit of administering phosphate of lime with advantage to rickety children suffering from curvature of the spinal column, and he gives it in the form of very fine filings of fresh bones; about one ounce daily, in milk, or in rice-milk. M. Piorry does not, however, attribute all the improvement which he has observed to this particular drug, inasmuch as a highly nutritious diet was simultaneously employed: but he says it is certain that, in several patients in whom the spinal column has continued to deviate more and more every year, and who were subjected during several months to good regimen, free exposure to light, a dry and warm temperature, and especially to the use of the phosphate of lime, the progress of the affection became completely arrested. All this may be conceded, but it does not follow that the lime salt had any influence upon the result. M. Piorry further thinks it probable that this remedy may prove useful not only in all forms of rickets, but also in the osteomalacia of adults, and in women threatened with softening of the bones during pregnancy, combining it in the latter case with iron. The insolubility of the phosphate of lime formerly prevented its direct administration; but, according to M. Kuchenmeister, of Zittau, this objection may be removed by uniting the phosphate with carbonate of lime, when a soluble combination and, according to this authority, a valuable remedy results.

In the earlier stage of the disease there is often a good deal of febrile disturbance, especially at night, and this is frequently associated with a relaxed state of bowels, and extremely fœtid evacuations. Such a state is best combated by small doses of rhubarb and magnesia, compound chalk-powder, or an occasional dose of castor oil. As soon as the bowels are brought to a healthy condition, tonics will be necessary, and none are so valuable as those of the chalybeate class, especially the vinum ferri for very young children, and the tincture of the sesquichloride for older ones. Quinine is another most useful drug, and the combination of these two agents in the form of the ferri et quiniæ citras, will be found very successful.

The remarkably flabby and atonic condition of the muscles, and indeed of the tissues generally, is suggestive of the idea that great benefit would be likely to result from the employment of the mineral acids, and in our experience this has been fully realized; the dilute nitro-muriatic acid with quinine, gentian, or cascarilla suits very well; it checks the free perspirations, gives tone to the relaxed mucous membranes, strengthens the digestive organs, and so improves the general nutrition.

The French authorities express unbounded confidence in cod-liver oil, which they appear to regard almost in the light of a specific, and to which they attribute the most remarkable results. We must own, however, to considerable disappointment in our experience with this agent. In some cases no doubt it greatly improves the general nutrition, but it does not appear to impart any tonic influence, and is not in our judgment to be compared with the more direct tonics, such as steel and quinine. Of late years, a preparation known by the name of "Parrish's Chemical Food" has been much extolled; it is a compound syrup of the phosphates of iron, lime, and soda, and certainly seems to do good, but unfortunately it is so nauseous that, in the delicate state of the stomach of a rickety child, it is by no means always retained.

In the matter of diet, we must try to induce the child to take meat twice a day, or concentrated soup may be given in small quantities; egg puddings, or eggs alone, may also be taken with advantage, and some stimulant, such as wine or brandy, will be necessary.

In all cases we must recognize in the rickety child a tendency to debility, and our one object should be to counteract that, and to correct any disorder in the excretions. This requirement will be still more necessary on the occurrence of any of the complications; lowering treatment under these circumstances will signally fail of its purpose, and will not only not help in the cure of the complications, but will materially deepen the rachitic cachexia.

With regard to the use of irons, splints, and other mechanical contrivances for supporting the legs of rickety children, many authorities object to them because they believe that the limbs subsequently become straight spontaneously. There seems, however, reason to doubt the correctness of this opinion; but all that we are disposed to recommend is that irons or splints be worn, provided they are made with joints corresponding to the hip, knee, and ankle; so that while affording sufficient support—for the legs bend because they cannot support the weight of the body—they need not unnecessarily interfere with the natural movements. When there is any tendency to curvature of the spine, a reclining or recumbent position should be adopted for some hours in each day, and if this and other treatment fail, we must employ some mechanical support.

IV. THE SYPHILITIC DIATHESIS.

Various hypotheses have been put forward to account for the occurrence of secondary or constitutional syphilis in the infant. It has been thought by some that it might arise from contact of the infant's body with a sore on the mother's genitals at the time of birth; others have attributed it, with more show of reason, to the infant's sucking the breast of a syphilitic nurse; others again explain the fact by supposing that the mother during pregnancy suffered from primary or secondary syphilis, and that her blood—although there is no real admixture of the maternal and fœtal blood—infected the infant; lastly, it may be that the taint is derived entirely from the father; the mother always having been, and continuing to be, healthy, unless she becomes affected by the diseased fœtus.

It is probable that all these modes of communication may obtain in different cases: certain it is that a child may inherit syphilis from either parent singly; we have seen cases where a syphilitic father has contaminated his offspring without infecting the mother, and in such a case the child may subsequently during lactation infect the mother through a cracked nipple; it is further thought by some observers that the fœtus *in utero*, syphilitic from the father, may, through placental contact, poison the blood of the mother, and so give rise in her to constitutional symptoms: thus from parent to child, and from child to parent, the syphilitic virus may be communicated, and constitutional symptoms result.

Much difference of opinion exists, probably from differences in the facts observed, as to the time when the disease first manifests itself after birth. In some few cases there is no doubt that very unmistakable symptoms are apparent at the time of birth; indeed, not a few cases of abortion are the direct result of syphilitic contamination, many more end in premature labour at the six or seventh month, and a certain few are still-born, prematurely or otherwise, in whom evidences of syphilis are apparent in the shape of cutaneous diseases, peritonitis (according to Sir James Simpson), disease of various viscera, and effusions into the serous cavities. The period when probably the disease more commonly manifests itself is from about the end of the first to the second or third month, it is very rarely later than that, though it has been known to occur even as late as the eighth and twelfth month. Of 249 cases, symptoms appeared in the first month in 118 cases, before the end of the third month in 217, and in only 32 cases was this date exceeded; so that in nearly half the cases symptoms began in less than a month after birth, and in seven-eighths of the cases they began before the end of the third month; while in only one-eighth of the cases did they begin after that date: hence, " if the physician has no information of the source from which the syphilis was derived, or if he doubts the authenticity of his information, he will be able, by having recourse to a calculation of probabilities, to decide whether infantile syphilis is hereditary or acquired, according as it shall have manifested itself before or after the third month of life." (Lancereaux.)

Symptoms.—For the first few weeks after birth, as has been stated, the infant may be to all appearances healthy; then, slowly, symptoms of coryza set in, with a peculiar snuffling respiration, a dry cough, slight difficulty in sucking, and dryness of the lips and mouth. The skin soon becomes dry, and has a peculiar colour, " it is neither pallor, nor jaundice, nor the straw-yellow of other cachexias." (Trousseau.) The voice shrill and hoarse—it has been compared to the squeaking of a penny trumpet; the mucous membrane of the mouth and throat becomes affected with superficial ulcerations, and an erythematous blush appears upon the nates, the external genitals, the feet and hands. Should the disease be unchecked, large patches of the skin assume a light-brown colour; the expidermis efoliates; the parts around the mouth, nostrils, eyes, buttocks, anus, and flexures of the joints become copper-coloured, fissured, and excoriated; the eyes get weak, and the margins of the eyelids sore; the eyelashes, eyebrows, and hair may fall off; the child becomes irritable, wastes rapidly, and daily grows weaker; and often suffers from sickness and diarrhœa, with occasional bloody stools and general derangement of the digestive functions. Condylomata may surround the anus. As a consequence of all this, the child is always crying, and is never satisfied, though it is fed regularly. In some fatal cases collections of pus have been found, after death, in the thymus gland.

These being in brief the general run of symptoms, it may be well to state them somewhat more in detail—and first with regard to the more obvious external lesions. The colour of the skin is often strikingly characteristic, it is of a peculiar dirty, muddy, or smoky hue, a kind of sallowness, to which is added a good deal of what may be called Addisonian or supra-renal capsular discoloration. After a while perhaps some cutaneous eruption will make its appearance, and of the various kinds the most common are erythema, papular eruptions, mucous patches, pustules of different kinds, but especially impetigo and ecthyma; vesicular eruptions, particularly eczema, and lastly, pemphigus, which is often very severe and even fatal. Of one and all of these it may be said that they are accompanied with a peculiar tawny reddish-brown or copper-coloured discoloration around and about the eruption. They are not usually attended by any itching or irritation. The pustular forms are generally later in their development.

Certain localities are more favoured than others by these syphilitic cutaneous eruptions: the erythemas appear mostly on the buttocks and in the external genitalia, in the flexures of joints, behind the ears, and in the parts adjacent to mucous orifices: the mucous patches show the same predilection for these parts. The pustular eruptions vary in their choice, for while impetigo mostly occurs on the face, neck, chest, and upper parts of the body generally, ecthyma, on the other hand, more often selects the lower limbs and buttocks; pemphigus again prefers the hands and feet, and this it is which in doubtful cases serves to distinguish the syphilitic from the non-syphilitic variety, for the latter has no such preference, but occurs equally in all parts of the body. The erythema which occurs upon the external genitalia, is peculiar for its tawny copper-colour; and in boys again there is this very striking feature upon which we have often determined a diagnosis—viz., that the scrotum has a very peculiar transparent shiny look, the skin being very thin, and waxy looking.

Another very well-marked feature in the syphilitic child is the condition of the incisor teeth. When the second or permanent set make their appearance, these teeth are found to present the following characters, the central pair of the upper jaw are remarkably short, narrow, and thin, especially at the lower part; after a while this breaks, and there is left a notch, which may continue for many years: besides this the incisor teeth are ribbed as it were horizontally, and this continues throughout the life of the tooth.

The inflammation of the mucous surfaces, especially that of the nose, larynx, and pharynx, together with the conjunctival mucous membrane, is a prominent feature in syphilitic children. In the former it sometimes leads to ulceration, and occasionally the disintegration extends to the nasal cartilages and bones, which become flattened, and so the shape of the nose, especially at its upper part, is destroyed. The peculiar "snuffles" which is so marked and early, a symptom of syphilis in children, is due to this inflammation of the Schneiderian membrane.

The serous membranes are much less liable to specific inflammations, though several authorities, the late Sir James Simpson, Wilks, and others, assert that they have met with evidences of peritonitis in the shape of bands of adhesion, &c., in cases of hereditary syphilis. It does not, however, appear that these were certainly connected with that disease, but the inflammation was of a chronic character, and had no apparent relationship to tuberculosis.

The organ which seems more than all others prone to degeneracy from hereditary syphilis is the liver. The disease, however, does not show itself usually till rather late, and is of no avail therefore in diagnosis, for the case is generally fully developed before the changes in question begin to be manifest; by this time the child is usually very ill, suffers much from diarrhœa and vomiting, and is a good deal emaciated. Notwithstanding the serious organic changes of the liver, jaundice is a very uncommon result, but ascites and œdema of the lower extremities are not unfrequent phenomena. The appearance which the liver presents is thus described by Gubler: "The liver, more voluminous than in the normal state, is turgid, globular, elastic, hard, and difficult to make an impression upon with the finger, which ends by breaking it without leaving any impression upon its surface; changed in its whole extent or only at certain points, it presents a peculiar yellow colour, comparable to certain pieces of gun flint, and in some cases it is studded with small opaque white grains having the appearance of grains of semolina; on section, its homogeneous tissue shows vascular striæ and opaque grains irregularly disseminated, and yellowish patches more or less large and extensive. Injection shows that the vascular network is almost impermeable. On microscopical examination there is seen in the substance of the gland a quantity, often considerable, sometimes enormous, of fibro-plastic elements in every degree of evolution, and in the midst of which the cells of the parenchyma are dispersed, and, as it were, drowned. This change may occupy only circumscribed parts, be limited to one of the lobes, or invade the whole extent of the organ."

Changes somewhat similar to these are observed also not unfrequently in the lungs, which become the seat of a kind of greyish-white hepatization, the tissue of the lung is completely infiltrated, and so solid as to sink immediately it is put into water, the smaller bronchi are compressed and almost obliterated. The extent of the pulmonary disease varies, it may involve an entire lobe, or even more. In one case related by Portal, "The right lung was almost entirely destroyed by suppuration, there were some abscesses in the upper lobe of the left lung, and the remaining substance of both lower lobes was hard, and resembled shrivelled leather."

The glands of the lymphatic system are very commonly affected by a kind of fibrous or lardaceous deposit, the bronchial glands being especially subject to it.

The spleen too undergoes certain changes. Dr. Samuel Gee states that in about one-fourth of the cases of hereditary syphilis this organ is much enlarged, that the extent of the enlargement may be accepted as an index of the severity of the cachexia, and that the majority of cases with great enlargement die. M. Parrot also says that newly-born syphilitic children are subject to enlargement of the spleen; but, he adds, they also suffer from inflammation of this gland, producing false membranes around the capsule. He seeks to explain the enlargement on the hypothesis that as the liver is constantly affected by a special kind of cirrhosis, the spleen becomes a reservoir for blood which cannot find an outlet through the liver and hence its augmentation of volume.

Other organs, such as the pancreas, the thymus gland, and the supra-renal capsules, are more or less subject to syphilitic disease.

Prognosis.—The duration of the disease varies. Death may occur at an early period; but under efficient treatment, recovery, or apparent recovery, usually takes place speedily. According to Lancereaux, a successful issue is not to be hoped for when the disease shows itself at the very moment of birth: it is rare when it supervenes during the first months of life, but is observed more frequently when it does not appear till after several years. Much must depend upon the extent and importance of the various organs affected with the syphilitic deposits. It is doubtful whether, when once the deposit has taken place, mercury has the power of absorption, but it undoubtedly possesses the power of arresting it, and of preventing it if taken in time, the prognosis therefore will be governed by the time at which mercurial treatment can be commenced.

Treatment.—Mercury, in some form or other, is the remedy *par excellence* for this affection. It has been recommended to cure the infant through the medium of the mother, by getting her system under the influence of mercury; but this practice is too uncertain to be depended upon, and is unjustifiable if the parent has no symptoms demanding a mercurial course. The best plan is either to administer the hydrargyrum cum cretâ or to apply the mercurial ointment, as recommended by Sir Benjamin Brodie. To an infant six weeks old, one grain of grey powder, with two or three of the compound chalk powder, may be given twice or thrice in the day until all the symptoms cease: or should this medicine gripe and purge, or be deemed inefficient, the mercurial ointment may be used, by spreading a drachm or more on the end of a small flannel roller, and then winding this round the infant's knee, repeating the application daily. The movements of the child will produce the necessary friction; and the cuticle being thin, the mercury easily enters the system. Sir Benjamin Brodie affirmed that, "Very few of those children ultimately recover in whom mercury has been given internally; but I have not seen a single case in which the other method of treatment—mercurial inunction—has failed."

Our experience, however, is entirely opposed to this, for, without any external applications, but by the internal administration of grey powder, or the solution of the perchloride of mercury, which, on the whole, we prefer as equally efficacious and more easy of exhibition, we have seen hundreds of cases get perfectly well in whom the syphilitic characters were very unmistakably advanced. We are quite aware of the strong advocacy of the non-mercurial plan of treating syphilis, but after having given this a patient trial, we have satisfied ourselves that mercury in some form or other is the specific remedy for hereditary syphilis, and we may add that we are not conscious of having seen any evil result from it.

Monti recommends the exhibition of ferrum iodatum saccharatum in the form of powder dissolved in milk and given at feeding hours. He states, however, that the drug is not sufficiently rapid for cases requiring prompt attention. Its chief virtue consists in the fact that it steadily improves nutrition. The system should be built up with tonics, especially the ferruginous, and all means employed to improve the general health.

In regard to any specific local diseases, as of the lungs, &c., it should be remembered that whatever medium is put in force for particular symptoms the main treatment must be directed to the constitutional taint, for until that is corrected, all merely local treatment must of necessity prove abortive, inasmuch as the local diseases are the direct results of general contamination.

The treatment for excoriations consists chiefly in attention to cleanliness, and in the application of some mercurial, such as the lotio nigra, or the unguentum hydrargyri ammoniata, or of the benzoated oxide of zinc ointment; or a cerate composed of one drachm of the unguentum hydrargyri nitratis to one ounce of lard may be applied. The condylomata may be touched, if necessary, with either strong hydrochloric or nitric acid.

PART III.

SPECIAL DISEASES.

CHAPTER I.

DISEASES OF THE NERVOUS SYSTEM.

I. INTRODUCTORY REMARKS.

THE extreme frequency of the diseases of the nervous system during the early periods of life, the alarming symptoms they give rise to, their great fatality, and the difficulties connected with their diagnosis, invest these disorders with very great interest. On this account therefore, we might very properly begin the consideration of the special diseases of childhood by a study of those of the nervous system; but there is another reason which has led us to adopt this course—viz., the remarkable way in which many other diseases influence the nervous system in children, and so give rise to a great variety of nervous phenomena. These, though chiefly functional, often simulate organic disease so closely, that much care is needed to discriminate between them. Moreover, there are some diseases of the nervous system traceable to derangement of other organs, which we ought to be able clearly to recognize. Hence the importance of an early acquaintance with these affections, which may be said, as it were, to lie at the root of the special pathology of childhood, for without a thorough knowledge of the symptoms of nervous diseases, functional or organic, the practitioner cannot hope for success in the therapeutics of children.

If anything were needed to show the extreme importance of this subject, it would surely be found in the fact, that in the Report of the Registrar-General for the year 1876, out of 510,315 deaths from all causes in England during that year, no less than 67,737 were due to diseases of the nervous system, or about 2,800 to every million of the population.

The cause of these affections is no doubt in a large measure due to the rapid development of the brain in early childhood, as well as to the great activity of the circulation, and the readiness with which this is disturbed. Before describing any of the special nervous diseases it may be well to make a brief survey of their more prominent symptoms, since the recognition of those which clearly belong to the brain or spinal cord will help us to appreciate others which are only indirectly referred to them.

An infant who is suffering from acute disease of the brain presents the following aspect:—He lies sad and listless in his nurse's arms; his countenance is anxious and haggard; the face frequently flushed; the eyes are turned away from the light; he is constantly moaning or uttering a piercing cry; his skin is hot; the pulse frequent and often irregular; and he is constantly putting his hand to his head, or striking at it; and when in his cot bores with the occiput into the pillow.

On examining the scalp, it is found to be hot, the veins prominent; the fontanelles tense; and the pulsations of the brain can be felt through them; the eye is, perhaps, half closed, the pupil contracted, and often one iris acts more readily to light than the other. On inquiry it will probably be ascertained that there is, or has been, nausea and vomiting, the efforts at vomiting continuing even when the stomach is empty and being apparently causeless; there is commonly constipation; and there are attacks of difficult breathing, the respirations being irregular, and not unfrequently there is a hacking cough; above all, at the end of a few days, there are attacks of convulsions, which cause great alarm to the parents, and often endanger the life of the child.

We take this opportunity to direct attention to the use of the ophthalmoscope. In no disorders of the system is its employment of greater importance to the physician than in the diagnosis of lesions affecting the encephalon. This remark applies especially to those cases of indefinable cerebral symptoms which may be forerunners of basilar meningitis or cerebral tumours. Hence we would impress on our readers the necessity of acquiring a thorough, practical, manipulative skill in the use of the instrument.

II. CONVULSIONS.

From the time of birth until the end of the seventh or eighth year, convulsions are of rather frequent occurrence, and are produced by a great variety of circumstances, but they ought as a rule to be regarded rather as a symptom than a disease *per se*. They are most common during infancy, probably because this is not only the most excitable period of existence, but there are at this time peculiar sources of irritation. Moreover, the disproportion between the spinal cord and the brain during early childhood accounts for the increased reflex excitability, and the greater tendency therefore to uncontrollable convulsive movements. Dr. West remarks with truth, that convulsions in children correspond to some extent to delirium in adults, and hence similar causes produce these diverse results.

The attacks very commonly—when not symptomatic of severe cerebral disease—pass off without any bad result; but when they recur frequently they are very apt to weaken the intellect, and to impair the general health; moreover, they prove the immediate cause of death in about 78 per cent. of all deaths due to disease of the nervous system during the first year of child life.

A few days after birth, children are subject to slight convulsive movements, to which nurses give the name of *inward fits*. The baby lies as though asleep, rolls his eyes about, moans gently, breathes with a little difficulty, and has twitchings of the muscles of the face: sometimes there is a livid ring round the mouth. This condition often arises from flatulence and indigestion, and is readily relieved by gentle friction over the abdomen, and the administration of two or three drops of the aromatic spirit of ammonia, with the same quantity of the compound spirit of ether. Generally, however, these attacks are of little or no importance, and do not call for any special treatment.

Hiccup is a form of convulsive action to which children are liable, and it sometimes causes them a good deal of distress: it may be merely symptomatic of dyspepsia; or it may be a sign of great danger—indicative of displacement of the viscera, as in ruptures or injury to a vital organ, or mortification of any internal part; or lastly, it may be the harbinger of approaching dissolution in the course of acute disease. When it exists in any distressing degree and is due to gastric or intestinal derangement—attention to diet, a mild antacid purgative, or a few doses of a sedative and anti-spasmodic or carminative mixture will generally suffice to cure it.

Symptoms of Convulsions.—In very slight cases the symptoms are merely such as we have described as inward fits: but generally they are much more severe. When an attack begins, the body becomes stiff, the limbs outstretched; the muscles of the face twitch, and the lips are drawn in all directions; the head and face are first red, then livid; the eyes start, the pupils are at first contracted, then dilated and insensible to light; the respiration is irregular and laborious; the pulse is frequent and small; the hands and feet are generally firmly clenched, the thumbs and toes turned inwards; and the contents of the bladder and rectum are voided involuntarily. At the end of one or more minutes the convulsions diminish for a few moments; when they either recur or altogether cease. In the latter case, the muscles generally become relaxed, and the natural appearance returns; the blood is again properly oxygenated, and the lips and face assume their healthy hue; the child looks frightened and cries; and then either falls into a sound sleep, during which it is bathed with perspiration, or—in unfavourable cases—he sinks into a state of complete coma and, perhaps, dies. In some cases only one side of the body is convulsed; or only one limb; or merely the muscles of the face are affected. In all cases the muscular actions are rarely equal on the two sides of the body; hence the general expression is greatly distorted, and the aspect of the little patient is very painful to look at. As a rule the more feeble the attack, the longer its duration; and sometimes the convulsive phenomena are almost continuous for several hours; occasionally they cease for three or four hours and then return, so that there may be three or four paroxysms during the day.

Causes.—Anything which over-excites the nervous system, or which interferes with the due performance of the functions of the nervous centres in such a way as to increase reflex excitability and to diminish the controlling power of the brain, is likely to induce a fit of convulsions. Hence they may arise from structural disease of the brain, as tubercle, phrenitis, apoplexy, &c.; from an insufficient supply of blood to the brain, as in weak, rickety, or badly nourished children; from a supply of impure or poisoned blood, as is seen sometimes during the course of the eruptive fevers, or in the progress of renal disease; from distant irritation affecting the brain by reflex action, such as that arising from the pressure of a tooth upon an inflamed gum during dentition, or from intestinal worms, or the passage of a renal calculus, or even simple indigestion; from general irritation produced by exposure to a cold and damp atmosphere; and lastly they may be produced by fright. We have already remarked that circumstances which give rise to delirium in the adult may probably induce convulsions in the infant, and we must be careful always to distinguish between the effect and the cause; in other words, between the disease or other exciting cause and the symptom, which is the convulsion. It is only by doing this that we can ever hope for success in treatment.

Mr. North observes, that the children of parents who marry too early or at too advanced an age are more susceptible of convulsions, than the offspring of those persons who marry in the prime of life. Hereditary predisposition has been also observed; thus Boerhaave gives an instance where all the children of an epileptic man died of some convulsive affection.

Treatment will of course vary according to the circumstances of each case; but the broad principles of treatment may be stated as follows. During the fit it is advisable to avoid all unnecessary interference; it being generally sufficient to loosen the clothing about the neck, chest, and waist, to raise the head, to sprinkle the face with water, and to admit plenty of fresh air. Subsequently the warm bath may be of signal service, cold being at the same time applied to the head: or a gentle douche of cold water over the occiput may be beneficial: or a bladder containing pounded ice may be laid upon the top and back part of the head. In one instance in which all the ordinary means of treatment failed to prevent the recurrence of convulsions—indeed the fits became more and more violent—the late Sir James Simpson had recourse to chloroform. The child—only one month old—inhaled the vapour with so much advantage, that at last it was kept more or less under its influence for twenty-four continuous hours:

at the end of this time all medication was discontinued, and there was no subsequent recurrence whatever of the convulsions. This is not an isolated case, for the same remedy has been on many occasions successfully used.

As a general rule, only very simple treatment is necessary during the fit, but much may be required when it is over, chiefly with the view of preventing a recurrence—thus, when the bowels are confined mild antacid purgatives will be needed; when there is much flatulence, carminatives; when the stomach contains undigested food, emetics; when the irritation is due to dentition, and the tense gum appears to offer an obstacle to the passage of the tooth, lancing the gums may afford relief; when there is restlessness, sedatives—especially the hydrocyanic acid, with a few drops of tincture of hyoscyamus; and when the blood is watery and deficient in red globules, ferruginous tonics. In cases of convulsions coinciding with the rickety diathesis, Dr. S. Gee administers bromide of potassium or ammonium during the convulsion, and for some days after, in the proportion of four grains to an infant of a year old, thrice daily. When the fits have ceased for a week or so, he advises cod liver oil and steel wine. We should always be very careful in treating a case of convulsions, to discover if possible the cause of the attack, inquiring especially as to the absence of previous head symptoms, the state of the digestive functions, the character of the excretions, and the indications as to the presence of worms. By a little care we shall scarcely fail in the matter of diagnosis.

The therapeutical indications in special forms of convulsions, such as epilepsy, eclampsia natans, spasm of the glottis or laryngismus stridulus, &c., will be considered in succeeding sections. The after-treatment of all cases must, of course, be modified according to the nature of the exciting cause.

III. CEREBRAL CONGESTION.

Owing to the activity of the nutritive processes going on in the brains of children, to the softness of the brain tissue, and to the yielding character of its bony case, a good part of which is, in the earlier months, little more than membranous, the circulation, both venous and arterial, is liable to very considerable modifications, and the consequences which may result from the vessels of the brain becoming overloaded during childhood are so important that the practitioner should be constantly on his guard to prevent the occurrence of this condition: it is one which often comes on in the course of diseases of distant parts, and sometimes gives rise to most troublesome complications. When the cerebral vessels become turgid from an increased flow of blood *to* the brain, it is termed *active* congestion; when from some cause impeding the return of blood *from* the head, *passive* congestion.

Active Cerebral Congestion may result from any cause which disturbs the circulation; but it is especially liable to occur whenever the poison of any of the eruptive fevers is circulating in the blood; it may arise also from the irritation of dentition, from exposure to the sun's rays, from blows upon the head, &c. In the case of the eruptive fevers it generally occurs, if at all, during the early stages, often before the disease has been clearly manifested, and the child may even die without the eruption appearing, but the existence of an epidemic at the time, and the probable occurrence of the disease in the same household and family, will be sufficient proof of the true character of the attack.

During dentition, the general feverishness, heat of skin, extreme irritability, and other clearly marked cerebral symptoms, are evidence of congestion of the brain, and slight causes are then often productive of serious results, such as convulsions, &c.

The *symptoms* to which it gives rise are general uneasiness, restlessness, and irritability; disturbed sleep, from which the child awakes with a start; twitchings of the muscles of face or tendons of the wrist; great heat of head, and pain which is increased by noise or any movement; tension and prominence of the anterior fontanelle; irregularity in the relative size of the pupils; contracted irides; quick, full, hard pulse; vomiting; and frequently a constipated state of the bowels. At the end of a few days—on the appearance of a rash in one of the eruptive fevers, or of a tooth having cut its way through the gum in dentition—the disturbance ceases, and the head symptoms pass away. In graver cases, indications of mischief induced by cerebral congestion begin to appear, and we have to combat those formidable maladies which result from hæmorrhage, from effusion of serum, or from "acute hydrocephalus." The symptoms here detailed may either occur suddenly and all at once, or they may come on with gradually increasing severity, according to the nature of the case and the cause of the attack. In like manner the symptoms may quickly disappear, or they may linger on for many days.

In the more formidable cases, supposing that the earlier indications do not yield to treatment, the feverishness, general distress, and irritability give place to more abiding and severe pain in the head, accompanied by a heavy, dull, congested appearance of the face, then to drowsiness and stupor, and finally to convulsions, out of which the child emerges only perhaps to fall immediately into a more profound stupor, ending in coma and death.

The *treatment* of active cerebral congestion necessarily varies according to the circumstances under which the congestion appears, and to the degree and severity of the symptoms. In some few cases, where the child is strong, and the symptoms are violent, it may be necessary to resort to the local or general abstraction of blood. But, if cold be properly applied to the head, we may very likely be able to avoid so serious a remedy: the best way of doing this, is to place a mixture of pounded ice and salt—F. 75—in two bladders, one of which is to be placed under the head, and the other laid against it, or held upon it by the nurse. If, in spite of this, the symptoms increase in severity, cold affusion should be employed: the child being laid upon the nurse's lap with its face downwards, cold water is to be poured upon the head from a little height, in a gentle continuous stream, for about five minutes—or less if the vital energies become depressed. It must be remembered that this is in reality a very formidable remedy, requiring great caution in its use, as well as no little courage, for it is not easy to put in practice so apparently heroic a remedy in such serious cases as would alone justify its use; at the same time, like many other severe remedies, it is undoubtedly of great power for good, and many authorities bear testimony to its value.

In regard to blood-letting, supposing the case sufficiently serious and the patient is strong and robust, not having been weakened by previous illness, leeches may be applied to the temples, and we have seen very good results follow, but we have never practised venesection, nor can we bring ourselves to believe that such a remedy is ever required for cerebral congestion in children of tender years, though we know it is recommended by some high authorities. Two, four, or six leeches may be applied to children of two, four, or six years of age, allowing them to bleed freely after; in this way from one to three ounces of blood may be taken, and more than that we do not consider necessary. Packing in the wet sheet is often very beneficial. In all cases active purgatives—F. 213, 219—to clear out the intestinal canal should be prescribed, for we have seen more good result from this than from any other means; the benefit is probably not alone due to the removal of offending matters, but much is no doubt effected by the indirect revulsive action. When the stomach is overloaded, emetics—F. 108, 109—are to be ordered; these, however, require to be given with very great caution, for the mechanical effect of the act is apt to be prejudicial, and it is only in cases when we feel tolerably certain that the attack is really due to the presence of offending material in the stomach, that an emetic is to be given. Chloral hydrate has been successfully exhibited in severe epileptiform convulsions coincident with the eruption of the molar teeth. Lastly, the child should be kept very quiet, free from all excitement, and in a cool, darkened room.

With regard to the subsequent treatment of the case, this must depend on its nature; but supposing that all active symptoms have passed off, probably little else will be required beyond the administration of an occasional alterative, and attention to a carefully regulated diet.

Passive Cerebral Congestion often occurs during the paroxysms of hooping-cough, or of laryngismus stridulus; and in some diseases of the abdominal viscera, as hypertrophy of the spleen or liver. It is sometimes seen in the pressure of a hypertrophied thymus, or enlarged and tuberculated glands upon the jugular veins, or to languid circulation from want of pure air or of sufficient nourishing food.

The *symptoms* indicating this condition are puffiness and general lividity of the face and lips; anxiety of countenance; pain in the head; tension of the anterior fontanelle; dilated irides; slow, irregular, oppressed pulse; coldness of the extremities; constipation; sometimes diarrhœa and sickness; and a disinclination for all kinds of nourishment. The child may die during a paroxysm of coughing, or it may gradually sink into a state of coma. *On examining the brain after death*, its membranes will be found gorged with fluid black blood, the choroid plexuses will be seen to be highly congested, and the surface of any section of the brain will present numerous bloody points. Repeated congestion is often associated with atrophy of the brain substance, as well as with marked dilatation of its vessels.

The *treatment* must consist in the use of antispasmodics—such as ether and hydrocyanic acid, F. 56, 57—to relieve the convulsive cough; belladonna will also be found a most valuable remedy for this purpose, and the researches of Dr. John Harley show that its power as a stimulant is of great importance; the sulphate of zinc is also very useful in the more chronic forms of pertussis, and it is in these cases that passive congestion is more apt to occur. Attention should be given to the state of the secretions and of the bowels, healthy action being induced when necessary by alteratives—F. 19, 20, 22, 31—the employment of the warm bath, or of the hot salt-water bath, while cold is applied to the head, is also a valuable remedy: and lastly, the administration of stimulants and tonics, particularly some preparations of cinchona with ammonia and chloric ether—F. 274, 278—will be necessary. At the same time, the body is to be warmly clad while the head is kept cool; nourishing food—especially milk and beef-tea—is to be allowed; and the child is to be kindly nursed, and its irritability gently soothed.

IV. CEREBRAL ANÆMIA.

Cerebral Anæmia may result from numberless causes—bad feeding, faulty hygienic surroundings, hæmorrhage, and as the sequela of specific diseases. It is characterized by depression of the fontanelles; a pale, shrunken face; dilated irides; imperceptible pulse; and relaxed bowels.

The *treatment* should consist of small quantities of food administered day and *night*, to which brandy or whisky should be added, in increasing proportions according as the child will take it. The body should be kept warm. Sometimes it is necessary to employ nutrient enemata. In these cases we must first wash out the rectum with warm water, and afterwards administer the enemata. The inunction of cod-liver oil has also been advocated.

V. CEREBRAL APOPLEXY.

From the consideration of cerebral congestion it is natural to pass on to that of apoplexy, which is one of the occasional, though rare, results of that condition.

From the Registrar-General's report for 1876 it appears that the total number of deaths from apoplexy in that year was 6,527 males, and 6,688 females, of all ages; of these, 410 of the former, and 323 of the latter occurred under 5 years: the numbers in each year are given in this table:—

	Under 1 Year.	1	2	3	4	Total under 5 Years.
Males . .	219	90	47	34	20	410
Females .	160	63	28	41	31	323
Total . .	379	153	75	75	51	733

In London alone the figures were, of all ages, 1,075 males, 1,078 females: of these there were,

	Under 1 Year.	1	2	3	4	Total under 5 Years.
Males . .	35	14	6	5	4	64
Females .	40	14	10	12	6	82
Total . .	75	28	16	17	10	146

These figures are remarkably suggestive of the causes of apoplexy when it is remembered that, owing to the larger size of male than female heads, the births of the former are generally more tedious and difficult than those of the latter.

Two forms of apoplexy are usually described as occurring during childhood: one of which is designated *cerebral* apoplexy, where the blood is effused into the substance of the brain; while the other is known as *meningeal* apoplexy, in which the hæmorrhage takes place between the dura mater and cranium, or into the cavity of the arachnoid membrane, or beneath the arachnoid into the meshes of the pia mater. Both varieties are rare, the cerebral form being the least common; while in by far the greater number of instances of meningeal apoplexy, the effusion is found in the cavity of the arachnoid rather than in either of the other situations.

There are these differences to be noted between the apoplexy which occurs in children and that met with in the adult; in the former it is more often meningeal, in the latter cerebral; in the former the hæmorrhage mostly comes from the rupture of the minutest capillaries, in the latter it more often takes place in somewhat larger vessels; in the former it is due primarily to congestion of the cranial contents, in the latter, to disease of the blood vessels; in the former the brain itself was usually healthy, in the latter it is generally diseased, and in a state of red or white softening. Dr. West has described what he calls a *cachectic form of cerebral hæmorrhage,* in which a diseased state of the blood seems to be the *fons et origo mali;* in the cases mentioned by him the effusion occurred into the arachnoid space.

Symptoms.—The symptoms of *cerebral apoplexy* are not quite the same in the child as in the adult. An arrest of volition and sensation takes place suddenly, then follow collapse with coldness of the surface, violent convulsions alternating with spasmodic contraction of the fingers and toes in the interval, unequal action of the pupils, slow and frequently stertorous breathing, and a small slow pulse; but paralytic symptoms are very rare. Dr. Richard Quain has reported an interesting example, occuring in a boy aged nine years, which was characterized by coma, convulsions, paralysis, and death in seven hours from the time of seizure—previous to which he was in the enjoyment of good health: after death, a large clot of blood was found in the right hemisphere of the brain, and the left ventricle of the heart was much hypertrophied. Billard also mentions the case of an infant only three days old and apparently quite healthy, who suddenly presented the ordinary symptoms of well-marked apoplexy, and died: a clot of blood was found in the substance of the left hemisphere of the brain, immediately outside the corpus striatum.

The distinction between cerebral and meningeal apoplexy was first pointed out by Serres; who believed that, whereas the former was always accompanied by paralysis, the latter did not produce this result. In some cases of *meningeal apoplexy,* occurring in infants at the breast, M. Legendre says, that after one or two vomitings, and in some instances without precursory vomiting, the children were seized with fever and with some convulsive movements, commonly of the eyes, producing strabismus; the appetite was lost, and the thirst considerable; the evacuations were natural, or perhaps somewhat relaxed. Soon a permanent contraction of the feet and hands was observed, which was quickly followed by tonic or clonic convulsions; during which sensibility and consciousness were abolished, and the face—always injected—assumed a deeper tint. In the interval of these attacks, there was drowiness, which gradually became more marked; but the fever continued during the whole course of the disease, and became stronger in proportion as the fatal termination approached. Then the convulsions, separated at first by longer or shorter intervals, grew more and more frequent; until in the last moments they became almost continuous.

The *duration* of the symptoms in all cases of apoplexy is very irregular, varying from a few hours to many days; they may end in permanent hemiplegia or paraplegia, or in death, or in complete recovery. When the hæmorrhage is considerable a fatal termination will be the result.

Treatment.—We can say but little upon this head: for in the first place we have never seen a case of apoplexy in the young child; and secondly, the symptoms are so obscure—especially in the meningeal form—that it is to be feared a correct diagnosis will seldom be formed sufficiently early to be of much value. But it may be readily imagined that the best rule to follow is that laid down by Cullen for the relief of apoplexy in the adult—viz., *to obviate the tendency to death.* If this tendency be towards death by coma, if the pulse be full and hard, if the face be flushed and turgid, and especially if the external vessels of the head and neck are visibly distended, then active purgative enemata, ice to the head, the application of sinapisms to the lower extremities, and perhaps bloodletting, will be called for. On the contrary, when—as is the case in the majority of instances—the patient appears to be dying from the mischief which has been done and the general shock to the system, when the pulse is feeble or almost imperceptible, and the skin cold and clammy, then antiphlogistic measures of any kind will only insure a speedily fatal termination; and we must endeavour to maintain life by the use of warmth to the feet and trunk, sinapisms to the chest, and by the cautious administration of wine.

VI. TUBERCULAR MENINGITIS.

Acute inflammation of the brain is a not very uncommon disease of early life; that is, of children under five years of age, as is shown by the following tables.

The total number of deaths of all ages in England from "cephalitis" in the year 1876 was 3,491 males, 2,784 females, and the numbers for each year under five were as follows:—

	Under 1 Year.	1	2	3	4	Total under 5 Years.
Males . .	881	535	264	210	148	2,038
Females .	614	373	268	192	141	1,588
Total . .	1,495	908	532	402	289	3,626

In London alone the figures were, of all ages, 607 males, 486 females; and the numbers in each year were:—

	Under 1 Year.	1	2	3	4	Total under 5 Years.
Males . .	167	109	45	50	31	402
Females .	126	75	48	39	25	313
Total . .	293	184	93	89	56	715

Inflammation of the brain rarely occurs in children previously healthy; when it does so, it may be regarded as simple phrenitis or encephalitis, as will be shown in the following section. When it is the result of tubercular deposit in the brain or its membranes, when it occurs, in fact, in tuberculous children, it is then known by the term "tubercular meningitis." The tubercular deposit may be situated at the convexity or the base of the brain. In the former case the affection is denominated "meningitis of the convexity," and in the latter "basilar meningitis." We shall consider the latter form only, as it occurs the more frequently.

Symptoms.—The symptoms of tubercular meningitis present great variety and uncertainty; but for convenience they may be arbitrarily considered as exhibiting three stages. The *first* or *premonitory stage* comes on slowly with indications of declining health, and loss of flesh, colour, and appetite. Perhaps a troublesome cough alone attracts attention; until there appear signs of cerebral congestion, together with general fever, the latter presenting exacerbations and remissions at irregular periods. The skin is then found to be harsh and hot; the appetite is capricious—sometimes bad, sometimes voracious; there is not much thirst; the tongue is furred; the breath is offensive; there is often nausea and vomiting, valuable signs of incipient tubercular disease; and the bowels are disordered—generally constipated, the evacuations being unhealthy and deficient in bile. If the child is old enough to run alone, it soon gets fatigued; has frequent attacks of giddiness, but very seldom any headache; and sometimes in walking it seems to drag one leg. Although drowsy, he is restless; sleeps badly, moans, or grinds his teeth, screams, and awakes suddenly in alarm, without any apparent cause.

After the foregoing symptoms have become thoroughly established, the disease, if unchecked, passes into the *second stage;* when its nature becomes very apparent, and its cure almost, if not quite, hopeless. The child wishes to remain quiet in bed; his countenance is expressive of anxiety and suffering; his eyes are closed, and eyebrows knit; he is annoyed by light and suffers much from the slightest noise. The face becomes flushed alternately with pallor, a central red spot being observed on each cheek which is succeeded by a peculiar slaty or ashy appearance. The child may be quiet or moaning in a low tone of voice, interrupted by a sharp distressing cry, which has been regarded as pathognomonic, and hence termed the *cri hydrèncephalic*. If old enough to reply to questions, he complains of distressing headache, weariness, and sleepiness; crying out frequently, "Oh! my head, Oh! my head." This pain is one of the most constant phenomena, and usually continues as long as consciousness lasts. As this stage advances, the pulse—which has hitherto been rapid—becomes diminished in frequency, and very irregular, often falling in a few hours from 120 to 80; the slightest exertion, however, accelerates it. "Sometimes there is a peculiar vibration in the pulse, and the size of it is out of proportion to the age of the child, from complete loss of arterial tension before the heart's force has failed." (Hillier.) The temperature is generally increased, though less proportionally than in some other tubercular diseases. The symptoms increase in severity at night; and the mind wanders, or there is noisy delirium. Stupor and heaviness now come on; the little patient lies on his back almost in a state of insensibility, perhaps picking, with tremulous fingers, his nose and lips; convulsions frequently occur, and sometimes paralysis; while, at the same time, the urine and fæces are passed unconsciously.

The transition to the *third stage*, at the end of a week or two, is sometimes effected very gradually by the drowsiness passing into profound coma, from which it is impossible to rouse the child. In other instances the child becomes comatose quite suddenly; and immediately afterwards is attacked with convulsions, which often put an end to the painful scene; the convulsions may, however, begin much earlier, and then, according to Rilliet and Barthez, it is indicative of tubercle in the brain. Occasionally, however, death does not occur until the lapse of several days: and not perhaps until there have been delusive appearances of improvement. This "lightening before death" does not long continue. The little patient again suffers from dyspnœa, difficult deglutition, cold clammy sweats, convulsions, and coma; until he sinks emaciated and completely exhausted, having struggled and fought the battle to the last.

There are some symptoms which are not peculiar to any one stage, but may occur at either or all; of these, vomiting is perhaps the most constant, and constipation is also very frequent, the former is sometimes very obstinate, begins early and is persistent, the ejected matter being cast up apparently without any effort. The abdomen often presents a peculiar appearance from the marked retraction of the abdominal walls. Paralysis not unfrequently occurs in the course of the disease, very often it is hemiplegic and occasionally it affects one eyelid (ptosis), or one eye (strabismus), or one side of the tongue. There is usually great intolerance of light, and the pain in the head is often so severe, that the little sufferer cannot bear even the slightest jar of the bed, or the least noise. The disease is probably most common between the third and fifth years of age.

Dr. Allbutt has pointed out that when the tubercular deposit has invaded the anterior and inferior parts of the encephalon, the ophthalmoscope reveals congestion of the optic disc and retinal vessels and sometimes optic neuritis.

Diagnosis.—Great care must be taken not to confound this disease with a peculiar affection of the brain which is induced by loss of blood, diarrhœa, or other debilitating influences; and which, as it gives rise to symptoms often bearing a remarkable resemblance to those above described, has been termed by Dr. Marshall Hall, *Hydrocephaloid Disease*, a subject which we shall consider further on in a separate section. Another affection we have to differentiate is typhoid fever. Whilst tubercular meningitis occurs in children before the fifth year, typhoid fever is very rare until after that age. In the latter the persistent nausea and vomiting are absent; the bowels are relaxed, the motions being watery and stained with bile; the abdomen is tympanitic and tender on pressure, especially in the right iliac fossa; the tongue is dry and red at the edges and tip; the skin is pungent; there is great thirst; the temperature is marked by increasing evening exacerbations; delirium sets in early; and there are distinct remissions of symptoms. Simple gastric disorder, though simulating tubercular meningitis, may be diagnosed by the history of the attack, the heavily coated tongue, and the absence of marked febrile disturbance, and the distressed expression of face. A brisk emetic or purge in this case, will speedily restore the patient to health.

Prognosis.—This is unfavourable, even in the early stages; more especially when there is any hereditary tendency to tuberculosis. The large experience of M. Guersant tends to the conclusion that the disease is invariably fatal. Recovery from advanced hydrocephalus is so rare that Dr. West has never seen one instance of it; and only one case in which the child got well after the second stage had commenced. M. Rilliet also remarks that all the instances in which recovery from hydrocephalus is said to have occurred, took place before the real nature of the disease was understood; but that since its tubercular nature has been recognized, no well-authenticated case has been published by any French physician. He, however, records one case in the *Archives Générales de Médecine*, December, 1853.

The average duration of the disease, from the setting in of well-marked symptoms, is about twenty days; when the symptoms have run their course very rapidly, death has occurred in two days.

Morbid Anatomy.—The post-mortem appearances usually found are, traces of inflammation of the membranes of the brain; effusion of greenish jelly-like serous fluid beneath the arachnoid and in the meshes of the pia mater, as well as the presence of false membranes between the arachnoid and pia mater; occasionally there is a thick puriform looking fluid, with a good deal of greenish yellow lymph. These appearances are always most marked at the base of the brain, about the pons varolii, optic nerves, and in the longitudinal fissure. The cerebral substance often contains separate tubercles, while granular tubercular deposits may be seen scattered upon and between the membranes. According to the recent researches of Dr. Bastian, it appears that these tubercular granulations occur mostly on the epithelial layer of the sheaths surrounding the vessels of the pia mater; the tubercles are of the yellow miliary character, and are met with in greatest abundance about the fissure of Sylvius. But the characteristic morbid appearance consists of softening of the central parts of the brain, especially of the soft commissure, the velum interpositum and fornix, with effusion of thin, transparent serum into the ventricles. Thus, in thirty-eight out of forty cases in which death has taken place under the symptoms of tubercular meningitis, Dr. West discovered an appreciable quantity of fluid in the ventricles; while in thirty-four of the cases the quantity was considerable, amounting to several ounces. The fluid is but slightly albuminous, clear and almost colourless, but contains a large quantity of potash salts and phosphates. In a few instances the whole brain is found to have lost much of its natural firmness; but commonly the softening is confined to the central portions, and varies in degree from a slight diminution of consistence to such an extent that the cerebral matter resembles thick cream. It has been thought by some observers that this softening is due to contact with the effused fluid, but it seems much more likely to be the result of inflammatory action.

Sometimes tubercle is found in the brain itself, either embedded on its surface or as separate masses in the substance of the brain. Deposits of tubercle are also generally found in other organs of the body: their most frequent site being the lungs and bronchial glands; and the next in frequency—the liver, spleen, mesenteric glands, and intestines. Meningitis may be associated with tubercular ulceration of the intestines, in which case diarrhœa will be prominent.

Treatment.—Our treatment, to be at all successful, must be prophylactic; for if the disease becomes well established, medicine can do little or nothing. Hence, when we find a mother having an evident tendency to tuberculosis, or when we learn that she has already lost children by this disease, we should forbid her suckling, and should take especial care that her infant be reared by a strong and healthy wet-nurse. The infant is to be warmly clothed; it should be taken into the open air daily, if the weather will permit; it should have the benefit of country or sea-air at least for some weeks in the year; and at the period of weaning it should be carefully watched, while the new diet is to be simple but nourishing. In any illness that may affect it, all lowering remedies must be abstained from if possible, or at all events if thought necessary they should be used with great caution. Care must be taken to shield the child from the contagion of the eruptive fevers, hooping-cough, &c.; and, as it grows older, the intellectual faculties must be cultivated with moderation and judgment. Supposing that with this care the infant does not thrive, its diet should be made more nourishing, tonics and especially quinine and iron, if there be any anæmia, should be given, and cod-liver oil—in drachm doses, twice daily—should be administered.

But if we do not see the patient until the disease has set in, what is to be done then? The treatment of tubercular meningitis is beset with difficulties; for, as an inflammatory affection, it is generally said to require remedies which the sufferer—a sickly child—will not bear.

With regard to depletion, we doubt very much whether it ought to be had recourse to under any circumstances.

Some physicians recommend blisters to the vertex or nape of the neck, but the good to be derived from them is problematical. An ointment composed of one part of tartar emetic to two of simple cerate has been recommended; a piece the size of a nut being rubbed over a portion of the scalp every two hours until an abundant eruption is produced. Dr. Hahn, in his work *De la Méningite Tuberculeuse, étudiée au point de vue clinique*, asserts that he has cured advanced cases with this remedy; other practitioners also speak favourably of it; but though we have tried both these remedies we have never seen any benefit result from them, and the suffering which they occasion is a very great objection. In purgatives, however, we possess a valuable class of remedies, provided that they are given so as to maintain a free action of the bowels for several days —F. 213, 219—and in the early stage.

At the same time that these agents are employed, the continued administration of calomel, in one or two-grain doses, twice or thrice daily, has been recommended. But, considering that tuberculosis is itself a condition of great constitutional depravity, and that mercury tends directly to impoverish the blood and to lessen vital power, we cannot too strongly condemn the employment of this remedy. Nor is our objection based on theoretical grounds merely, for we believe that, in the cases in which we have seen it employed, not only has no benefit resulted, nor any amelioration of the symptoms followed, but the too surely fatal issue has, in our judgment, been hastened by its use. On this point Dr. West remarks, "I put no faith in calomel, nor in the production of salivation, as a means of curing hydrocephalus. I have seen children die whose mouths had been made sore by mercury, and I recollect two who at the time of their death, were in a state of most profuse salivation." The employment of cold to the head is likewise an important remedy when used in the first stage of the disease. A rag wetted with cold water, or any simple evaporating lotion laid on the child's head and frequently renewed, will generally suffice: but it may be necessary to have recourse to the use of ice.

When the child is teething, many practitioners resort, as a matter of course, to scarification of the gums; forgetting that the irritation arises from the passage of the tooth through the bony canal of the jaw, rather than from pressure on the gum. Such practice is only to be adopted when there is distinct evidence that the gum is offering resistance to the tooth, a condition the existence of which we very much doubt, or when there is decided tenderness and swelling of the gum. Should the vital powers become much depressed, either from the course of the disease or from the use of the remedies, stimulants must be freely had recourse to. We have frequently given a child from six to twelve months old a teaspoonful of port wine and water—equal parts, of port wine and beef-tea in the same proportions—every hour, or every second hour, with the greatest advantage. If physic is preferred, some ammonia with Hoffmann's anodyne may be ordered, or according to F. 257, 258. The diet must be light but not poor: good veal-broth or beef-tea, the yolk of an egg beaten up in milk, and arrowroot will often be serviceable. When the sickness causes all food to be rejected, iced water is sometimes very useful.

There is nothing more difficult, perhaps, in medicine than the determination of the actual value of a given drug in a certain disease. The present case is particularly so, and therefore we speak with great diffidence in expressing our opinion that iodide of potassium is a valuable remedy in this disease. In one case in particular, the effect which followed the employment of this drug—whether as a result or not we will not positively state—was so marked, that we have no hesitation in recommending a trial of it. It requires, however, to be given so as to get the full effects of the drug. One or two grains may be given every hour or two at first—in a child two or three years old—and we prefer to combine with it the syrup of the iodide of iron.

Cod-liver oil is also a favourite remedy of ours, even when the disease is fully established; we have found this retained by the stomach sometimes when almost everything else was rejected. This too, we give as freely as possible—a teaspoonful every two or three hours for instance—for we believe that with both these remedies, saturation, so to speak, is the object to be aimed at, and nothing short of that is likely to be of service.

Regarding the question of alleviating the little sufferer's pains and inducing sleep, we would recommend such remedies as aconite, chloral hydrate, in combination with bromide of potassium, and lastly, morphia. But their administration is only indicated when the attack, having begun with great excitement, this condition persists after free purgation, and when treatment as regards the disease, is useless.

In a disease which is avowedly so fatal, and so apparently without a remedy, anything which offers even a remote chance of success merits at least a trial.

VII. HYDROCEPHALOID DISEASE. (SPURIOUS HYDROCEPHALUS.)

No one who has had experience of this disease will doubt the extreme difficulty which there often is in diagnosis, nor question the importance of it in regard to treatment; indeed there is probably no disease of which it may be more truly said that to make a mistake is fatal, for whereas the true disease, which we have preferred to call by its more accurate designation, "tubercular meningitis," is almost certainly fatal, this, the spurious counterfeit, is, if properly managed, almost as certain of cure. The description first given of it by Dr. Marshall Hall is still true to the life; he divides it into two stages, the one characterized by irritability, the other by torpor. "These two stages resemble in many of their symptoms the first and second stages of hydrocephalus respectively. In the first stage the infant becomes irritable, restless and feverish; the face flushed, the surface hot, and the pulse frequent; there is an undue sensitiveness of the nerves of feeling, and the little patient starts on being touched, or from any sudden noise; there are sighing and moaning during sleep, and screaming; the bowels are flatulent and loose, and the evacuations are loose and disordered. If, through an erroneous notion as to the nature of this affection, nourishment and cordials be not given, or if the diarrhœa continues, either spontaneously, or from the administration of medicine, the exhaustion which ensues is apt to lead to a very different train of symptoms. The countenance becomes pale, and the cheeks cool or cold; the eyelids are half closed; the eyes are unfixed, and unattracted by any object placed before them, the pupils are unmoved on the approach of light; the breathing, from being quick, becomes irregular and affected by sighs; the voice becomes husky; and there is sometimes a husky teasing cough; and eventually, if the strength of the little patient continue to decline, there is a crepitus or rattling in the breathing. The evacuations are usually green; the feet are apt to be cold." We would add, that the fontanelles are usually depressed, the pulse is frequent and feeble, and the temperature is not increased.

Though these few lines by no means convey a complete picture of this affection, they are quoted here, because they serve at the outset to impress the reader with that which is the most salient feature in it, viz., its essentially adynamic character, and though it may come on rather suddenly, it never occurs primarily in children of robust health: it is the feeble, delicate, and exhausted who are especially, indeed it may be said solely, subject to it; and in the majority of cases, it occurs more as a sequel to other diseases than as a primary affection. Diarrhœa is, perhaps, its most certain forerunner; but other diseases or accidents, and notably those which produce rapid exhaustion and failure of nervous power, as hæmorrhage for instance, predispose to spurious hydrocephalus.

Bearing in mind this association, the supervention of cerebral symptoms in the course of an exhaustive disease, whether those symptoms occur suddenly and severely, or more gradually, and with less severity, the patient seeming, as it were, to glide into them, their true nature and import can hardly be mistaken. Moreover, when the affection occurs in connection with some concurrent exhaustive disease we may generally detect some sort of relationship between them, the one improving with the other. When on the contrary, it occurs, as it does occasionally, though much more rarely, and then only in feeble delicate children, at the outset of some acute disease, the true character of the attack will not be overlooked, if we are careful to inquire into the general symptoms, and are not satisfied with merely studying these cerebral symptoms, to the exclusion of others referable to the lungs or elsewhere.

Nor will the diagnosis rest merely, or indeed principally, upon existing symptoms, so much as upon the negative evidence afforded by the absence of those which are more peculiar to the true disease. For instance, the tubercular diathesis, the severe pain in the head, the tense fontanelle, the slow, irregular pulse, the constipation, the retraction of the abdomen, the peculiar "cry," &c., all these point with tolerable definiteness to the true disease, and their absence equally to the spurious variety. The early stage of hydrocephaloid disease may be confounded with the onset of pneumonia in a healthy child. Careful auscultation will soon decide the diagnosis. Indeed, we have a further aid in the thermometer. If the temperature rises within the first forty-eight hours to 104° and remains at that height, we may be quite certain we have to deal with an affection of the lungs and not of the brain.

It is probable that the *post mortem* appearances would be much more negative than positive, inasmuch as the symptoms are due rather to functional than organic disturbance of the nervous centres. Indeed, we know of no morbid changes which would be regarded as proof of this disease; passive congestion or anæmia would equally produce the symptoms referred to, though the latter condition, from the probable origin of the affection, would be the more common.

There are few diseases in which, if a correct diagnosis is established, *Treatment* is more successful than in spurious hydrocephalus. Two principles should guide the practitioner in his therapeutics: first to allay nervous excitability; and, secondly, to maintain the vital powers. In children there are few things more decidedly calmative than the warm bath, and this may be made still more so if to a gallon of hot water a quart of decoction of poppies is added: hyoscyamus, paregoric, and camphor, are also valuable remedies in the earlier stage of excitement. If diarrhœa be the immediate exciting cause of the attack, that should of course be checked by suitable remedies, astringents combined with opiates. To fulfil the second indication light, nourishing food, with a moderate, in some cases a liberal, supply of stimulants will be necessary. In all this no absolute rule can be laid down; each case must be treated on its own merits, and the amount of stimulant necessary must be governed by the age and condition of the child—tonics will also of course be advantageous, and none are better than quinine and steel wine.

VIII. SIMPLE ENCEPHALITIS.

Our knowledge of the effects of inflammation of the parts within the cranium is not sufficiently perfect to enable us to point out with certainty the symptoms which indicate inflammation of the substance of the brain—phrenitis, as distinguished from that of the membranes—meningitis ; and fortunately the distinction is not of much practical importance, since it is doubtful whether meningitis or phrenitis ever occur as separate diseases. Simple idiopathic encephalitis is a very rare disease during childhood : while tubercular inflammation, as we have before remarked, is not very uncommon.

Symptoms.—The disease generally sets in suddenly with a violent attack of partial or general convulsions, accompanied by fever, obstinate vomiting, and severe pain in the head. As the convulsions diminish, the child becomes drowsy or comatose, and continues so for a few hours until they return. When they again cease there is often vomiting, and a return of the stupor ; subsultus tendinum, trismus, squinting, contraction of the pupils, and perhaps hemiplegia. The pulse is quick, small, and irregular ; the motions are sometimes passed involuntarily ; the face is pale and the expression vacant ; and at the end of three or four days, death takes place either during a fit of convulsions, or in a state of coma.

In some forms of simple inflammation of the brain the course is somewhat different. At the commencement there is sickness, drowsiness, great irritability, frontal headache, and general fever—lasting perhaps for seven or ten days ; convulsions then make their appearance. The convulsion is generally long and severe ; and it may be followed immediately by coma, which in a few days is fatal ; or it may recur frequently at short intervals, and pass into coma at the end of twenty-four hours ; Dr. Watson thinks that when nausea and vomiting are the earliest symptoms in adults, the inflammation has had its origin in the cerebral pulp—in the substance of the brain ; and that when the attack commences with a convulsion, the inflammation has commenced in the pia mater or arachnoid.

In all the forms of this dangerous complaint there is great variety in the symptoms, and close observation is necessary to put us on our guard against the insidious character which many of the cases assume, and the deceitful appearances of amendment which often take place. Fortunately the disease is of rare occurrence. It may terminate fatally in a few hours, or the patient may struggle on for two or three weeks : or, although death is the most common termination, yet recovery may ensue in children with good constitutional powers.

Causes.—As we shall hereafter treat of the occasional occurrence of inflammation of the brain from disease of the internal ear, it will suffice here to put the practitioner on his guard against this affection, which, though it may give rise only to pain and discharge at first, is apt to become chronic, and in this condition may progress insidiously, but very mischievously, if neglected. The other causes of simple meningitis are not very clear. In some cases it has been attributed to dentition, but this we think is obviously inadequate; in some, to the suppression of an eruption on the scalp; in others, to exposure of the head to the sun; and again in others, to injuries —such as blows and falls.

Diagnosis.—As these cases are likely to be mistaken for cases of tubercular meningitis, the principal point to be attended to in the diagnosis, is the presence or absence of previous ill-health, of tubercular history, and the character of the attack itself. In the simple variety of inflammation, the attack begins quite suddenly in a previously healthy child; in the tubercular form there is always a history of failing health. In the one there is either a history of hereditary phthisis, or there is actual evidence of that diathesis.

The *post-mortem* appearances usually found are, great vascularity of the meninges; a loaded state of the sinuses; serous effusion beneath the pia mater and into the ventricles; the deposition of pus or false membranes between the bone and the dura mater, or the dura mater and arachnoid; thickening of the membranes; and ramollissement or softening of the cerebral substance. That which specially distinguishes this affection from the one just considered, is the absence of all evidence of tubercular disease either within the cranium itself or in other parts of the body.

Treatment.—The means which in our opinion are most to be relied upon are the sedulous application of cold to the head, the use of purgatives, the exhibition of the iodide of potassium, and restriction to a light and moderate diet. With regard to the use of cold, we believe it will be found most valuable; but it must be applied continuously for many hours, the condition of the child being watched. Pounded ice, or an artificial freezing composition, F. 75, or a mixture of pounded ice and salt, placed in bladders—as before directed, are invaluable aids. Active purgation—F. 215, 219—so as to empty the intestinal canal, and perhaps to produce a revulsive action on the mucous membrane, will be needed; this should be followed by the administration of the iodide of potassium—F. 15, 18. From our own observations during the past few years, we believe that this last agent is by no means as frequently employed in the acute inflammations of childhood as it deserves to be. Given in doses of one or two grains every four hours, dissolved in weak tea or plain barley-water, we have seen it produce relief in croup, and in some severe cases of bronchitis; and although we have not had an opportunity of trying it in the disease under consideration, yet we cannot help thinking that it would prove very valuable.

Mercury and blood-letting are two remedies which have very powerful advocates: with regard to the latter Dr. Meigs says—"Venesection ought always to be preferred to local bleeding, even in the youngest children, unless it is impossible to find a vein, or unless this is evidently too small to bleed well. If we cannot succeed in performing the operation at the bend of the arm, we must resort to the vein running over the inner ankle, or to the external jugular. When venesection cannot, from any reason, be employed, blood should be freely drawn by means of leeches or cups. It is customary to apply the leeches to the temples or behind the ears. I may remark that MM. Rilliet and Barthez object to the application of leeches to the head, and propose that they should be placed rather about the anus, or on the inferior extremities." It need scarcely be said that our opinion with regard to this remedy differs widely from the advice here given, and the most that we are inclined to concede is, that in cases evidently of a plethoric habit, and where the convulsions are very severe, the application of one or two leeches to the temples may be advantageous. We believe, however, that equal good results from the rigorous employment of cold locally. As to mercury, we cannot say even so much in its favour, and we would strongly deprecate its employment with the view of promoting the constitutional effects of the drug.

Counter-irritants to the scalp can only be of value when it is thought—if such a supposition can ever be entertained—that the encephalitis is due to the suppression of some cutaneous eruption, and even then we think it better to apply the counter-irritant rather to some part removed from the head.

In all stages of the disease the practitioner must watch his little patient almost hour by hour; he must be careful to keep him dry and clean; and see that the bladder does not become distended.

Should the disorder happily yield to these measures, great care will be requisite for some time—especially with regard to diet and the avoidance of all excitement—to prevent a relapse.

IX. THROMBOSIS OF THE CEREBRAL SINUSES.

We are indebted to Professor T. von Dusch for one of the best essays on this disease. The formation of coagula in veins has been variously explained. Hunter was of opinion that the clots were due to an exudation upon the inner surface of the inflamed veins. Cruveilhier and others subsequently asserted that they were true coagulations of blood, the immediate consequence of phlebitis. Virchow has, however, demonstrated that in the majority of cases coagulation precedes inflammation.

The sinuses of the brain, with the veins of the true pelvis and the lower extremities, are liable to the coagulation of their contents by reason of their anatomical character and position. Those of the brain, more particularly the longitudinal and lateral sinuses, are especially liable to this lesion from the canals deviating from the circular form, from the slight dilatations of calibre and projecting partitions in the walls, and from the peculiar manner in which the venous trunks discharge their contents into the superior longitudinal sinus—mostly in the opposite direction to the current. All these circumstances tend to retard the venous circulation, and hence favour coagulation.

Though the disease in question is comparatively very rare, the careful records of cases have permitted an almost accurate division of it into two classes according to the exciting cause. 1. It may be brought about by any disease which lessens the supply of blood to the brain, favouring retardation of the current; and 2. by any disease which, increasing the viscidity of the blood, tends to the formation of thrombi. The first division affects childhood more especially, and the second, adult and middle life.

Pathology.—In cases where the supply of blood has been diminished, the thrombus has been specially situated in the superior longitudinal sinus. It has generally been of firm consistence; the wall of the sinus has remained unaltered; whilst inflammation of the brain and membranes has been rare, effusions of blood have been frequent and extensive; and there have been no metastatic processes. Where the viscidity of the blood has been increased, the thrombosis, though confined as a rule to the lateral sinus, has extended to the internal jugular vein and even to the vena cava superior. Thrombi have also been observed in the superior petrosal sinus. The thrombi have been in a state of suppuration, and mixed with pseudo-membranous clots and fresh blood clots. The walls of the sinus have been thickened and in some cases perforated. The brain has been slightly discoloured, or a little soft, or abscess has formed in its substance. There has been œdema and hyperæmia of the pia mater, and serous or sero-purulent effusion into the lateral ventricles. Extravasations into the brain have been rare. Metastatic abscesses and hæmorrhagic infarction of the lung, associated with suppurative pleurisy and pericarditis, or pleurisy alone, have been frequently observed. The liver and spleen have been enlarged and hyperæmic, and the glands of the small intestines increased in size.

Causes.—Under the first division of a diminished blood supply, the causes are said to be due to a deficient energy of the heart's action, as in marasmus, or as the consequence of precedent acute or chronic diseases; or to diminution of the quantity of the blood, from losses of blood, or from profuse secretions; and lastly, to impediments to the expansion of the lungs preventing the right side of the heart from emptying itself properly, as from pneumonia, atelectasis, pleurisy, or from deficient action of the respiratory muscles. Viscidity of the blood may be due to gangrenous, erysipelatous, and suppurative inflammation of the neck, face, orbits, bones of the skull, and the brain and its membranes—their vessels being associated with the sinuses; or to the mechanical pressure or presence of foreign bodies and tumours.

The *Prognosis* is necessarily unfavourable. Death has occurred suddenly, or been delayed for two or three weeks.

There are no pathognomonic *Symptoms;* but we may diagnose the affection by the occurrence of profuse diarrhœa in a weakly child, cerebral symptoms, depression of the fontanelles, overlapping of the bones of the skull, the unequal distension of the external jugular vein of the two sides, and sometimes by the distension of individual veins of the face. Where the affection is due to inflammation of a gangrenous, erysipelatous or suppurative character there are rigors and adynamic fever. The supervention of the affection under this division is specially to be observed in cases of otitis or necrosis of the bones of the skull.

The *Treatment* resolves itself into alleviating complications as they arise and gently soothing the sufferer.

X. HYDROCEPHALUS.

Hydrocephalus, chronic hydrocephalus, as it is generally called, or dropsy of the brain, is met with in children at various ages, as the result of a great variety of circumstances. When congenital as it often is, it is generally associated with malformation of the brain—with deficiency of some of its parts, and not unfrequently with spina bifida. It is sometimes the result, and sometimes it is said, though we believe very rarely, the precursor of tubercular meningitis: occasionally it occurs in connection with tubercle of the brain. The head attains a very great size in this disease, the unossified sutures readily yielding to the pressure of the liquid: the skull of James Cardinal—who lived to the age of twenty-nine years—measured rather more than thirty-two inches in diameter. The serous fluid is usually contained in the lateral ventricles, which are often expanded into one cavity; very rarely the effusion takes place only on one side; in either of these cases it is called internal hydrocephalus: occasionally it is collected in the sac of the arachnoid, and then it is termed external hydrocephalus.

Symptoms.—The effects of dropsy of the brain are not very uniform. Frequently the bodily functions are but little impaired, sometimes not at all, till a short time before death; it is remarkable also how little the mental powers are affected in many cases, though in some instances it produces complete idiocy. The most frequent symptom is convulsions: in some cases there is a fit daily, but it may be slight, and consist only of a twitching of the muscles of the mouth, or of a peculiar rolling of the eyes. The enlargement of the head may not become apparent until the disease has existed some short time; but in congenital cases it is usually apparent from the birth, and in a very large proportion of the cases the symptoms begin very soon after birth. Dr. West says that in 50 out of 54 cases the disease began to show itself before the end of the sixth month. As the affection progresses there is wasting of the flesh; the infant sucks greedily, yet gets weaker; the head seems too heavy, so that the child cannot support it in an erect position; there is generally constipation, and the evacuations are unhealthy; there is drowsiness, but the sleep is disturbed; vision is impaired, sometimes lost, and sometimes there is strabismus; there may be spasmodic attacks of dyspnœa; paralysis is a very common accompaniment, especially in the more severe cases where the effusion is great: the palsy may be limited to one side or one leg, and in our experience it is more often limited to the lower than the upper limbs; or it may be paraplegic, which is the most common of all.

Although essentially an affection of childhood, yet cases are recorded in which it has affected adults; thus the celebrated Dean Swift suffered and died from it.

Prognosis.—As a general rule, almost every case is fatal, either directly, by convulsions; or indirectly, by rendering its victims more liable than healthy children to other diseases, and less able to bear up against them; or lastly, by the slower process of wasting, debility, and gradual decline. Professor Gölis, of Vienna, affirms, on the contrary, that of the cases which began after birth, and which were seen and treated early by him, he saved the majority: such a result, however, is certainly not the rule in this country, for though something may be done by treatment to prolong life, the cases in which it can be said that a cure is effected are very few and rare: at the best we can seldom do more than maintain the *status quo*, the patient meanwhile being alike feeble in mind and body.

Pathology.—Very little indeed is positively known as to the pathology or cause of this affection, but there is a good deal of evidence in favour of the view that, in cases which are congenital, or in which the symptoms begin soon after birth, some malformation of the brain exists and may be the starting-point of the evil. It seems further probable, that chronic inflammation of the lining membrane of the ventricles is the real cause of the serous effusion; and this equally in congenital cases, as in those occurring some time after birth. The history of many cases in which the symptoms were clearly traceable to a blow or fall on the head, or to some external injury, and in which on *post-mortem* examination evidence of inflammation of the ventricular lining existed, seems to prove this. Indeed, a thickened, opaque, and sometimes granular condition of the lining membrane of the ventricles, is the most constant of the changes observed after death, and in a few cases a similar state is seen in the membranes at the base of the skull. Occasionally tubercular matter is found either in the substance of the brain, or on its lining membrane, and the appearances presented are those of chronic tubercular or strumous inflammation. In the variety which is called external hydrocephalus, that is, where the fluid exists in the arachnoid cavity, the pathology is yet more doubtful, though MM. Rilliet and Barthez affirm that nearly all these cases originate in a hæmorrhage into the cavity of the arachnoid. In some few, however, simple atrophy of the brain exists, and is a probable cause of the accompanying effusion, such a condition being undoubtedly congenital. The effusion may also be the result of a passive dropsy due to the accidental pressure of some morbid growth upon the Venæ Galeni, or upon the lateral sinus. Whenever at birth the bones of the head are found to be softer than natural, deficient in ossification, and the fontanelles wide apart, even though the head is normal in size, or but very slightly enlarged, there we may suspect, and ought to be on our guard against, the probable supervention of hydrocephalus.

Diagnosis.—When the disease is thoroughly established, it can hardly be mistaken; the large globular head upon the diminutive, emaciated trunk and wasted extremities, together with the disproportion in size between the cranium and face—making the visage triangular, and producing a distressing but most characteristic appearance. The sagittal suture, as well as the fontanelles, is open, there is a divergence outwards of the temporal bones at their upper part, the eyes are pushed forward by the pressure of the intra-cranial effusion, and the corneæ are exposed. Bouchut states that the following changes detected by the ophthalmoscope are pathognomonic. 1. Congestion around the papilla, with patches of congestion on the retina and choroid. 2. Changes in the retinal veins around the papilla, such as dilatation, tortuousness, varicosity, thrombosis, and hæmorrhagic infarcts. In the earlier stages, however, the diagnosis is not so easy; *Hypertrophy of the brain* being very likely to be mistaken for chronic hydrocephalus, inasmuch as it sometimes produces well-marked symptoms of cerebral disturbance with enlargement of the head. In most of the recorded cases of cerebral hypertrophy there were epileptic fits, or paroxysms of convulsions; the intellectual faculties were dull; the head seemed too heavy to be borne; and headache was generally present. But when the skull enlarges equally with the undue development of the brain, there may be no morbid phenomena, since there will be no pressure. The general health, however, suffers; the child wastes, gets weak, and often becomes afflicted with rickets or scrofula. This condition must not be too actively treated, for the *nimia cura Medici* will only be baneful. The affection being characterized by a want of blood, we have to raise the tone of the general health, by bark or by some preparation of iron; by salt-water or tan-water sponging baths; by sea-air; and by a nourishing diet. A small horse-hair cushion, with a piece cut out large enough to receive the occiput, should be prepared for the child's head to rest upon.

On comparing this plan of treatment with that required in chronic hydrocephalus, it will at once be seen how important it is not to mistake one disease for the other. The error in the early stage of the disease is not very easily avoided. But in hypertrophy of the cerebral mass the symptoms are less serious than in chronic hydrocephalus; they come on more slowly; and the head seldom attains the same size. In the latter affection, also, the fontanelles and sutures are more widely open, and the head assumes a more rounded appearance, than in the former, in which the enlargement is especially at the occiput; moreover, in dropsy of the brain there is often a certain amount of transparency, which can be readily recognized if a light be held upon one side of the head. In hypertrophy; the downward expression of the eye, peculiar to hydrocephalus, is absent; the anterior fontanelle and sutures are somewhat depressed; there is more or less dyspnœa; the decubitus is on the spine, with the head thrown back and the occiput bored into the pillow, the opposite to the posture in hydrocephalus, in which the little patient lies on its stomach with its face buried in the pillow. In hypertrophy, the child is well nourished; in hydrocephalus, it is thin and prematurely old in its appearance.

Treatment.—The plan advocated by Professor Gölis, after great experience, consists in the administration of calomel in quarter or half grain doses, twice daily: together with the inunction of one or two drachms of mild mercurial ointment into the shaven scalp once in the twenty-four hours. At the same time the head is to be kept constantly covered with a flannel cap, to prevent all risk of the perspiration being checked. If no improvement be perceptible after a lapse of six or eight weeks, diuretics—as the acetate of potash, or squills, or both—are to be combined with the mercurial treatment; and an issue should be made in the neck or on each shoulder, to be kept open for months. When convalescence is once established, he thinks benefit is derived from small doses of quinine—a quarter of a grain three or four times daily. A decoction of Doronicum Germanicum has also been highly recommended.

Two remedies—*compression* of the head, and *Puncturing* it—have been strongly advocated by some writers. Compression is best effected by bandaging, or by the application of strips of adhesive plaster applied over the whole of the cranium, so as to make equal pressure on every part. In cases where there are no symptoms of active cerebral disease, pressure will probably do good, and the rules laid down by Trousseau as to the mode of application are worthy of attention: he advises that strips of plaster should be used about half an inch wide, that they should just overlap one another, and that they should be applied, 1st, from behind the ear on one side to the temple on the opposite side; 2nd, from the back of the head along the vertex to the root of the nose in front; 3rd, from one side of the head to the other in its whole length and across the two former strappings; lastly, one long strip should be made to encircle the head three times just above the ears and below the occipital protuberance; the ends of the other strips should be turned up over the circular strip after its first turn, and then the remaining circular strips should be applied so as to keep all *in situ* firmly and securely fixed. Dr. Howslip Dickinson employs a broad elastic band to the head, a much easier and readier appliance. Care must be taken to avoid any mischievous compression, and where active symptoms exist, the case is probably not fit for this method of treatment.

Puncture is performed with a small trocar and canula at the coronal suture, about an inch and a half from the anterior fontanelle, so as to avoid the longitudinal sinus, the trocar being introduced in a perpendicular direction ; only a part of the fluid is to be taken at one time, and gentle pressure must be kept up both during its escape and afterwards. This operation is only to be had recourse to when other means have failed, or where the head is of great size ; and when the bones of the skull have not become united together. Dr. West thinks that little good is likely to result from this procedure except in cases of external hydrocephalus, still he is not altogether opposed to it in other cases. While resorting to either proceeding, constitutional remedies are not to be neglected ; and we would especially advise the administration of cod-liver oil, of iodide of potassium—or what is better in many cases, iodide of iron, and of mercury in alterative doses, such as two or three grains of the hydrargyrum cum cretâ every night.

Sir Thomas Watson mentions two hopeless cases—a lad whose age is not stated, and a boy about twelve years old—successfully treated on a plan suggested by Dr. Gower, after the administration of mercury in the usual form and of other remedies had failed to give the slightest relief. Ten grains of crude mercury were rubbed down with a scruple of manna and five grains of *fresh* squills. This formed a dose which was taken every eight hours, for three or four weeks. It caused a profuse flow of urine, great debility and emaciation, but no ptyalism. When the symptoms of hydrocephalus had disappeared, the health was restored by steel.

XI. CEREBRO-SPINAL MENINGITIS.

The Royal College of Physicians defines this disease as "A malignant epidemic fever, attended by painful contractions of the muscles of the neck, and retraction of the head. In certain epidemics it is frequently accompanied by a profuse purpuric eruption, and occasionally by secondary effusions into certain joints. Lesions of the brain and spinal cord and their membranes are found on dissection." There is no evidence of the disease being contagious or infectious. It may occur in summer or winter. It attacks the young, and especially the male sex.

Symptoms.—The invasion is ushered in by sudden rigors, then follow vomitings, violent pain in the head and along the spine, forcible retraction of the head, abdominal pains, hyperæsthesia, contracted pupils, weak pulse, and pyrexia with evening exacerbations. In a few days, delirium sets in with tetanic contraction of the muscles of the neck and spine, and sometimes trismus. Herpes are noticed on the face and back. The tongue from being moist and furred, becomes dry and brown. The bowels are constipated. The patient, at first unable to bear any noise, afterwards becomes deaf. If not tossing about, the decubitus is on the face. The pupils are dilated, and the breathing irregular in the late stages. Death may occur from the first day to the seventh month.

Morbid Anatomy.—There is more or less vascularity of the cranial dura mater and spinal canal, and purulent infiltration of the pia mater. The brain substance shows signs of inflammation, and is pulpy near the ventricles.

Diagnosis.—This affection has to be distinguished from typhus and typhoid fever, and tetanus. The history, the negative symptoms, and the late cerebral symptoms must be our guides.

Prognosis.—The mortality varies from 20 to 80 per cent. The disease is most fatal at the commencement of an epidemic, and in infants and young children. Convalescence is usually very tedious.

Treatment.—We must depend on a liberal nourishing diet, stimulation, and opiates. Mercury and iodide of potassium have seemed to do good in some cases. Leeches have often relieved the headache, and ice-bags to the head and spine have benefited other cases.

XII. TUMOURS OF THE BRAIN.

Tumours of the brain, though very uncommon in childhood, are occasionally met with, and as they generally present sufficiently well-marked symptoms, we may make a few remarks upon them here, though unfortunately in a therapeutical point of view there is little or nothing to be done for them.

There are three kinds of tumour or morbid growth to which the brains of children are liable—viz., tubercle, or tubercular deposit; cancer; and hydatid cysts.

Tubercle occurs in the brain in childhood generally in connection with its deposit in other organs, but occasionally, though very rarely, it exists there alone, and sometimes it is in conjunction with tubercular disease of the membranes. It appears to exist in the form of separate masses in about 10 per cent. of cases of tuberculosis. As regards age, cerebral tubercle is much more common before than after the age of five: thus, of 69 cases, 37 occurred in children under five; 23 between the ages of five and ten; and 9 between ten and fifteen. MM. Rilliet and Barthez have examined the bodies of 312 children, between the ages of one and fifteen years. They found turbercle in the brain in 57 of these cases.

The *Symptoms* are chiefly those caused by mechanical pressure, and necessarily vary according to the locality of the brain in which the tubercle is situated: pain, chiefly paroxysmal, and situated for the most part in the forehead, is a frequent symptom, but its intensity varies according to the rapidity of growth in the deposit, and the parts involved; when the tubercle is in the cerebellum, the pain is said to be most severe in the back of the head; convulsions sometimes occur but are not common. If the tumour be near the surface of the brain, rigidity of muscles is a frequent result. Paralysis of some of the muscles of the face, of the eye, or eyelids, often occurs with dimness of sight or complete amaurosis. Sometimes there is loss of power in the lower limbs, with unsteadiness of gait, or choraic movements, vomiting, especially during severe attacks of pain, constipation, febrile disturbance, twitching of muscles, loss of flesh and strength, and occasional epileptic seizures, with or without resulting impairment of the intellect, are among the symptoms which vary in frequency in different cases. With all this there is a general failure of health.

The symptoms vary a good deal according as the growth is rapid or otherwise, for, as is the case with other organs, the brain adapts itself in a remarkable manner to tissue changes which are of slow formation, but resists severely any of rapid growth. Occasionally rotatory movements are observed, and sometimes there is wry-neck.

The ophthalmoscope reveals congestion of the optic disc and the retinal veins, and diminished calibre of the arteries.

The fatal issue, and that is the usual result, is generally preceded by an acute stage, having very much the character of acute meningitis, and lasts for a very variable period, in some only a few hours, in others several weeks, death being usually preceded by coma and convulsions.

The *post-mortem* appearances vary a good deal. The tubercle, which is usually of the yellow variety, hard, soft, or cretaceous, may be in one mass, or in many, varying in size from a millet seed to a good sized bean, or even larger. They may exist in any part of the brain, but are usually found on the upper surface; they are sometimes associated with tubercle in the meninges: there is sometimes effusion into the ventricles or arachnoid, and the brain itself may be softened round the seat of the tubercular deposit. Congestion or inflammation is generally observed.

The *Diagnosis* is by no means an easy matter at all times, and it is often only by careful and continuous observation that we can come to a right conclusion. The principal symptoms on which we should rely, are the occurrence of severe paroxysmal attacks of headache without apparent cause; occasional obstinate or seemingly causeless vomiting; dimness or complete loss of sight without any change in the eye, except occasionally atrophy of the optic nerve; convulsions of one limb or set of muscles, or of one side; paralysis of any single muscle or set of muscles, especially about the face; muscular rigidity, or twitching of muscles as in chorea; and especially a tendency to rotatory movement. Where the majority of these symptoms exist, we shall not be far wrong in diagnosing tumour of the brain, and if at the same time the patient has unmistakeable evidence of tubercular disease in other organs, we may be pretty sure the tumour is tubercular.

The *Prognosis* can hardly be other than unfavourable, for recovery, though not impossible, is of exceeding rarity. At the same time, inasmuch as tubercle has been found in the brain in a cretaceous and perfectly quiescent state, the patient having died of some other disease, and having shown no cerebral symptoms for years before, this fact is evidence that a cure may be brought about, and justifies, therefore, the hope that something may be done by—

Treatment.—The only remedies, however, on which we may place any reliance are those which are ordinarily found useful in other tubercular diseases. Cod-liver oil, the iodide of iron, iodide and bromide of potassium, are clearly the drugs most to be trusted. The utmost care should also be paid to the state of the liver and bowels; and the strictest quiet should be enjoined; excitement of every kind will be prejudicial. Sometimes counter-irritation to the back of the neck may be useful, if continuously persevered with, especially where there is evidence of some inflammatory action.

We have said that there are other tumours which occur sometimes in the brain in children besides those we have described—viz., cancer, and hydatid cysts. Both are exceedingly rare: but we have seen two cases of cancer cerebri. In one of these the disease began in the eye; this was removed, but the cancer returned in the course of the optic nerve: the child died exhausted by convulsive attacks, and, on *post-mortem* examination, a cancerous mass was found in the site of the pons Varolii. The other case was one of congenital cancer in which almost every organ of the body was affected by it, and among others, a mass was found at the base of the brain.

Hydatid disease of the brain is equally if not more rare. Either of these growths would be recognized by the symptoms of pressure which they would produce upon the brain in their development, and as distinguished from tubercle there would be the absence of all the tubercular characteristics.

XIII. DISEASES OF THE SPINAL CORD.

The study of the diseases of the spinal cord in children presents, if possible, even greater difficulties than does that of the brain, because the natural state of the child in early life is, in some prominent aspects, analogous to that which indicates disease of the spinal centre. Moreover, the reflex excitability in children is, as we have seen, so extremely acute, that eccentric causes are very apt to produce results which it is often exceedingly difficult to distinguish from those having a centric origin. Certainly there are no diseases which require greater discrimination, tact, and careful clinical study.

Spinal Congestion may be due to injury, to fright, to masturbation, or to the cessation of habitual discharges, as the catamenia or the hæmorrhage of piles.

The *Symptoms* are characterized by the suddenness of their onset, the incomplete paralysis in a paraplegic form, tingling in the tips of the fingers or toes of the paralyzed limbs, dull aching along the spine increased by warmth, shortness of breath, and a proneness to relapse. There is no anæsthesia or exaggeration of reflex excitability in the paralyzed limbs; no paralysis of the bladder or sphincter ani; no tenderness on pressure along the spine; the pains in the back and limbs are not increased by movement; no marked impairment of electro-contractility and electro-sensibility in, and no wasting of the paralyzed muscles; bed-sores are very rare.

The *Post-mortem* appearances are unsatisfactory. There may be some engorgement of the spinal cord and membranes, with some excess of the spinal fluid, and slight infiltration with blood of the cellular tissue exterior to the dura mater.

The *Diagnosis* will be comparatively easy on examining the symptoms with those of spinal meningitis and myelitis.

Prognosis.—The affection generally terminates in slow recovery: death, however, has occurred suddenly in some few cases.

The *Treatment* consists in that advocated in myelitis. Any suppressed discharge should be combated by setting up its equivalent.

Spinal Irritation is essentially an affection either nervous or functional in its character. It may be due to congenital predisposition, to a strain or blow on the spine, neglect of gymnastic training, onanism, or want of alcoholic stimulants. The symptoms are those of spinal tenderness; nervous pains, often in connection with tenderness in a particular part of the spine with associated nausea, retching, vomiting and eructations; spasmodic cough; palpitation; irritability of the bladder; prolonged muscular contractions; variability and inconstancy of symptoms; and a nervous constitution. The spinal tenderness is pathognomonic.

The *Treatment* should consist of counter-irritation by blisters to the affected portion of the spine, and by local depletion by leeches or cupping. Pain should be relieved by some sedative, and the system built up with quinine, iron, phosphorus, and cod-liver oil.

Spinal Meningitis is a very uncommon affection in this country, although an epidemic of it prevailed in the Irish workhouses about two-and-twenty years ago, and in many parts of France between the years 1842 and 1844. In the former instance it was almost confined to boys about twelve months old; in the latter, it affected youths at the period of puberty.

Causes.—These are very obscure. The affection may be due to cold, injury, rheumatism, syphilis, the suppression of some habitual discharge, the extension of cerebral meningitis, disease in the bones and ligaments of the spine, tetanus, chorea, or some particular disease.

Symptoms.—The disease usually comes on suddenly with pain in the abdomen, vomiting, purging, and collapse; succeeded in a few hours by strong reaction, heat of skin, frequency and irregularity of pulse, stiffness of the muscles, retraction and fixing of the head, rigidity of the limbs, cutaneous hyperæsthesia, and delirium; occasionally there is squinting, sometimes contraction but generally dilatation of the pupils, convulsions, coma, and death. Dr. Radcliffe has enumerated the following symptoms as of primary importance:—"Fits of pain produced by movement along the spine and in the extremities; fits of muscular stiffness in the painful parts along with the pain; intervals of comparative or complete freedom from pain and muscular stiffness so long as movement can be avoided; absence of paralysis; some exaltation of sensibility; loss of power over the bladder; partial loss of power over the bowel; absence of spinal tenderness; absence of marked spasmodic symptoms; difficulty of mastication and deglutition; difficulty of breathing; no increased reflex excitability; no priapism; fits of perspiration, no active inflammatory fever; no marked head-symptoms."

The *post-mortem* appearances show vascular injection of the dura mater, effusion of turbid, sero-purulent or purulent fluid between the arachnoid and pia mater; at times, sanguinolent fluid in the space outside the dura mater; obliteration of the rachidian space by inflammatory adhesions; the surface of the arachnoid roughened or altered by calcareous or other deposits, or the opposing surfaces adherent.

Diagnosis.—We must differentiate this affection from myelitis. The symptoms of the two diseases are so opposed to each other that the diagnosis should not be very difficult.

Prognosis.—All forms of this disease must be regarded as unfavourable. The acute variety is very formidable, generally terminating fatally in from four to seven days.

Treatment.—Absolute rest in the recumbent position, with the limbs a little lower than the back, is essential. The bladder must be catheterized. Any stiffness and aching of limbs should be relieved by shampooing or friction. The general nutrition must be well supported. We may give internally either iodide of potassium, opium, or calomel and opium. Locally, ice or soothing embrocations should be applied to the spine.

Myelitis or Inflammation of the Substance of the Cord is more rare than the preceding. It generally produces softening of the cord with paralysis. The following is an interesting example of it taken from Dr. Mauthner's *Treatise on the Diseases of the Brain and Spinal Cord in Children,* and quoted by Dr. West:—

"A girl aged eleven years, whose occupation as a sempstress obliged her to remain for many hours daily in a sitting posture exposed to cold draughts, was seized three weeks after following this employment, with dragging and tearing pains in the back of her neck. As these pains grew more severe, voluntary power over the arms became impaired, and the paralysis increasing rapidly in spite of the application of leeches to the back of the neck, she was admitted into the Hospital for Children at Vienna, under Dr. Mauthner's care, on 26th December. Both arms were then completely palsied, flaccid, cool, and almost insensible; the lower extremities still obeyed the will, but the girl was unable to stand firmly. The mind was clear, appetite good, deglutition easy, pulse natural; and in these respects her condition continued unchanged to the last, except that on the day of death the pulse became very frequent. On the 28th the legs were palsied, and the urine passed involuntarily. On the 29th, voluntary power over the hands and feet was completely lost, and sensation was imperfect. On the 30th, sensation was quite lost in all the extremities: the child desired to pass fæces, but had not power to do so. On the 31st, the sphincter ani was likewise paralyzed and open to the size of a shilling. On January 4th, the hardened fæces began to fall out of the gaping anus: the respiration was feeble, and the articulation difficult. On the 6th there was much distress; for many days there had been no sleep; the whole of the left side of the body was completely paralyzed; and only the right side of the chest moved in respiration. The exhaustion was so extreme that the voice was scarcely audible, but the muscles of the face still retained the power of motion and sensation perfectly, and the intellect was quite clear: the child died the same night. The spinal cord presented the only morbid appearance; the membranes being perfectly healthy. The medulla oblongata was as soft as butter, of a yellow colour, without a trace of its natural organization; and the same condition was presented by the whole of the spinal cord as low as the cauda equina, where it once more resumed its natural appearance and character."

Causes.—This affection appears specially to be due to the strumous diathesis. In adult life it has been referred to excess of sexual indulgence.

The *Symptoms* are thus summed up by Dr. Radcliffe:—Paraplegic anæsthesia, ushered in by tingling or some similar sensation in the parts which eventually become anæsthetic; paraplegia ushered in by uncontrollable restlessness; a disagreeable feeling of tightness around the waist and elsewhere; absence of pain in the spine and extremities—of pain produced by movement more especially; absence of spasmodic symptoms; want of control over the bladder and rectum; absence of local spinal tenderness; altered sensibility to heat and cold, by which a feeling of burning is felt when a sponge soaked in moderately warm water or a piece of ice is applied to the spine immediately above the seat of inflammation; diminution of electro-motility and electro-sensibility in the paralyzed muscles; annihilation of reflex excitability; dyspnœa and feeble circulation; a tendency to bed-sores, wasting, and other signs of defective nutrition in the paralyzed parts.

The *Post-mortem* appearances may exhibit either hardening or softening of the cord. The latter is the more frequent, the appearances being similar to those detailed in the case already quoted.

Diagnosis.—We have to eliminate spinal meningitis, and locomotor ataxy. A comparison of the symptoms of the former with those enumerated in myelitis will suffice. As regards the latter, the affection is one of advanced years; the precipitate, staggering gait with the heels coming down with a stamp at each step would be diagnostic.

The *Prognosis* in acute or chronic myelitis is most unfavourable. Death may occur in fifteen hours, or life may be prolonged to the second week.

Treatment.—Dr. Brown-Séquard has advised a decubitus on the abdomen or side, so as to drain away the blood from the spine. The general tone of the system must be maintained or augmented. We must further administer cod-liver oil, perchloride of iron, phosphorus, arsenic or bichloride of mercury, to improve the nutrition of the cord. Lastly, we must not omit local means for promoting the recovery of the paralyzed muscles.

Chronic Myelitis sometimes results from caries of the vertebræ; and sometimes from injury to the cord by shocks, blows, strains, &c., without any disease of the bones. It generally occurs in strumous children. When produced by caries, the paralysis which results is due partly to the inflammatory action, and partly to the distortion of the spine and the mechanical compression of the cord.

Much good may result from cod-liver oil, iodide of iron, iodide of potassium, and the compound syrup of the phosphates—" Parrish's Chemical Food " as it is called.

XIV. INFANTILE TRISMUS.

Infantile trismus, trismus nascentium, tetanus of new-born children, or nine day fits, is a peculiar malady which occurs in infants about the commencement of the second week after birth. This affection is very rare in this country, but was very common in the Dublin Lying-in Hospital until the late Dr. Joseph Clarke introduced improvements in its ventilation and cleanliness: it is still very frequent in the West Indies.

Symptoms.—The onset of this disease is in general gradual. Some hours after birth it is perhaps noticed that the infant is very fretful, frequently whining and crying; its sleep is disturbed, and during sleep there appear to be curious attempts at smiling; it is restless when awake, and twists its limbs about without any cause; there is a livid circle round the eyes; the evacuations from the bowels are greenish and slimy; and there is generally a great desire for the breast.

After these indications have been more or less noticed for a few days, and sometimes without any warning whatever, the infant is seized with violent irregular contractions and relaxations of the muscular frame, especially of the muscles of the extremities and face. These convulsive movements recur at uncertain intervals, and produce various effects. Sometimes the agitation is very great; the mouth foams; the thumbs are turned to the palms of the hands; the jaws are locked from the commencement, so as to prevent the action of sucking and swallowing; any attempts to wet the mouth or fauces, or to administer medicines, seem to aggravate the spasms; the face becomes turgid and of a livid hue, as do most other parts of the body. From this latter circumstance nurses speak of this affection as "the black fits." The conflict lasts from eight to thirty hours, and in some very rare instances to about forty hours; when the powers of nature seem to sink exhausted and overpowered by their own exertions. There is a milder variety, termed by nurses "the white fits," in which the paroxysms are less frequent, the power of sucking is enfeebled but not lost, and the attack is prolonged from three to nine days. (Dr. Joseph Clarke.)

The disease is peculiar to the early days of infancy, seldom occurring after the first week; it is essentially a spasmodic or rather convulsive affection having its seat in the spinal cord or membranes, which more recent observations have proved to be in a state of excessive hyperæmia.

Causes.—Although opinions on this subject vary, it seems impossible to doubt that a vitiated state of the atmosphere is a powerful predisposing cause. This may operate—as Professor Colles ingeniously suggested—by inducing an unhealthy form of inflammation or ulceration at the naval, and so leading to a kind of traumatic tetanus in which the wound, occasioned by the separation of the umbilical cord, is the immediately exciting cause. On the other hand, the same state of the umbilical vessels often exists without any such symptoms as we have described; and the converse is equally true; for in 46 cases of severe and fatal inflammation of the cord which occurred in the Prague Lying-in Hospital, in only five were there any convulsions, and in none did they assume the form peculiar to this disease. The experience of Dr. Collins in the Dublin Lying-in Hospital goes to prove most conclusively that a vitiated atmosphere was a potent cause of the evil at that Institution, for whereas formerly nearly 15 per cent. of the infants died of this disease, subsequently, by a greatly improved system of ventilation and general hygiene, this mortality was reduced to less than a quarter per cent. Hüttenbrenner is of opinion that the disease is not necessarily fatal. He divides it into two classes:—1. Cases in which there is high fever. These run a rapid course, and he thinks the tetanic symptoms are only objective evidence of a general blood-poisoning. 2. Cases unaccompanied by fever, in which the convulsions may be viewed as caused by peripheral irritation. He agrees with Kirchsetters that a high degree of fever does not necessarily indicate a fatal issue. Stadfeldt believes that very probably there exists a specific contagium for trismus. Marion Sims has put forth the theory that the disease is due to mechanical pressure on the medulla and nerves by an inward displacement of the occipital bone.

Morbid Anatomy.—The peritoneum covering the umbilical vein has been found in many instances very vascular, and this vascularity sometimes extends up to the edge of the liver: the portion of membrane in the course of the umbilical arteries is usually inflamed, the inflammation often reaching as far as the bladder. There have also been seen signs of inflammation of the coats of the umbilical arteries; and more rarely of phlebitis in the umbilical vein. Conjoined with these appearances, the vessels of the spinal arachnoid are engorged; and sometimes there is effusion of blood or serum into its cavity, or extravasation of blood external to the theca. Less frequently the membranes at the base of the brain have been found much congested.

Treatment.—All that we can do is to avert this fatal malady by hygienic precautions; by having the lying-in room clean and thoroughly ventilated, by attending to the mother's diet, and by taking care that the infant is kept clean and dry. With respect to the direct treatment, the inhalation of the vapour of chloroform, from its proved efficacy in other severe and intractable forms of convulsions, would seem to be of service, and though of course great care would be needed in its administration, a fatal result in childhood is of extremely rare occurrence: it would require to be administered continuously for many hours. The application of ice to the spine is also recommended, and the hot bath may sometimes be of service. As regards other remedies Dr. Collins says—"I have never seen an instance where the child seemed even temporarily relieved by the measures adopted. Calomel has been tried in large quantity, also in small doses often repeated, as well as extensive friction with mercurial ointment. I have tried frequent leeching along the spinal column, also repeated blistering over its entire length. Opium I have exhibited in many ways, both in very large and small doses; also tartar emetic in the same manner, and at times both combined. I have tried tobacco extensively, in the form of stupes and injections of various degrees of strength, from *one* grain to the ounce of fluid, to *five* or more; besides the frequent use of the warm bath, oil of turpentine, tincture of soot, assafœtida, and many of the ordinary purgatives and stimulants; and all, as far as I could judge, without a shade of relief." Chloral hydrate, however, is to be preferred of all remedies. It is a pure hypnotic, does not produce the after effects of the opium preparations, does not cause hyperæmia of the brain, and can be easily administered. The grand object is to procure quiet sleep, so as to ward off the long-persisting muscular contractions. This is well attained by the exhibition of chloral. The attack, in some non-fatal cases, has continued from fourteen to twenty-one days. The inhalation of nitrite of amyl has successfully aborted a threatened attack.

XV. EPILEPSY.

Epilepsy is a disease the leading symptoms of which are sudden loss of consciousness and sensibility, with clonic spasm, usually followed by coma; the attack recurring at intervals.

We have already seen that children are subject to various forms of convulsive seizures, and one very interesting point of inquiry is, whether these ever lead on to the affection we are now considering. The fact that epilepsy not unfrequently has an hereditary origin, and that confirmed epileptics have very often suffered from convulsions in early life, is strongly suggestive of this view. In 83 cases observed by Dr. West, 34 cases occurred before the second year, 15 between the second and fourth years, 28 between the ages of four and ten years, and 6 between the tenth and twelfth.

Symptoms.—There are sometimes, though not in the majority of cases, *premonitory symptoms*, sufficient to warn the patient of an approaching seizure. These warnings differ both in duration and character; in some cases they are so short that the sufferer has scarcely time to call out before the fit begins; while in other instances, many minutes, or even hours, elapse before the attack. Dr. Gregory, of Edinburgh, was assured by an epileptic that when a fit was approaching, he fancied he saw a little old woman in a red cloak advance towards him, and strike him a blow on the head, on which he at once lost all recollection and fell down. Spectral illusions, headache, giddiness, dimness of vision, confusion of thought, and especially that peculiar sensation known as the *aura epileptica*, constitute the most frequent premonitory symptoms. The epileptic aura is differently compared by patients to a stream of cold water; to a current of cold or warm air; or to the creeping of an insect, the sensation commencing at the extremity of a limb, and gradually ascending along the skin towards the head: when it stops, the paroxysm takes place.

In children, if the aura ever does take place, they are perhaps less conscious of it, or less able to describe it; but the fright which seems sometimes to alarm them before the fit actually begins may be due to this. In some, consciousness does not appear to be lost even though the convulsion is severe, but in general the characters of the attack are very much the same in the child as in the adult. The convulsive movements may be limited to one side of the body, or even to one limb, and they are very commonly more severe on one side than on the other.

The average duration of the fit is about five or eight minutes; it may last for half an hour or more. It may also be very slight or very severe, constituting the *petit mal* and the *grand mal* of the French. The periods at which the seizures recur are variable. At first there is often an interval of two or three months; but as the disease progresses the intervals become shorter, until hardly a day passes without one or more paroxysms. In recent cases especially, the fits often take place in the night, either on just going to sleep or on awaking. As may be imagined, various accidents are likely to occur from falls, &c., during the fit; and many children have been severely burnt from thus falling upon the fire.

As a rule, the commencement of the seizure is generally characterized by the utterance of a loud piercing shriek or scream, immediately after which the child falls to the ground senseless and violently convulsed. Hence the disease has been called by the vulgar the *falling sickness*, or more vaguely *fits*. During the attack the convulsive movements continue violent; there is gnashing of the teeth, foaming at the mouth, the tongue is thrust forward and often severely bitten, the eyes are fixed and partly open, the breathing is laborious or almost suspended, the face flushed and turgid, and death, in fact, seems about to take place from suffocation; when—gradually—these alarming phenomena subside, and shortly afterwards cease, leaving the epileptic insensible, and apparently in a sound sleep, or state of coma, from which he recovers exhausted, but without any knowledge of what he has just gone through.

Prognosis.—Epilepsy very seldom ends fatally; our prognosis therefore has reference rather to one of two questions; 1, as to the probability of a cure; and 2, as to the likelihood of the mind becoming affected. There is a further question which we may have to answer—viz., as to whether in any given case of convulsions in early childhood epilepsy is likely to result therefrom. To this an affirmative must be given, if the convulsive seizures are at all frequent or severe, and still more if they are apparently causeless.

In regard to the second question, there is no doubt that in severe, that is, long continued, or oft recurring attacks, the brain at last becomes so injured, its nutrition so much impaired, that imbecility and even idiocy may result: our prognosis, therefore, must be guided entirely by the severity of the fits. The earlier the age at which they begin, and the more frequent they are, the greater is the probability of mental derangement.

As to the chances of cure, this also will to a great extent depend upon the duration of the disease, upon the absence of hereditary influence, of any malformation of the brain, or any injury thereto. In the two latter cases the prognosis must be unfavourable, as also if the disease has been of long duration, and especially if it began very early in life.

Morbid Anatomy.—When an epileptic who has only laboured under the disease for a short time dies, no appreciable lesion of any part of the nervous system can, as a rule, be discovered. If death occurs during a paroxysm, the brain is often found more or less congested. In cases of long standing, disease of the cerebral blood-vessels, with softening or induration of the brain, may be found. Occasionally the bones of the skull are thickened or otherwise diseased. In some recorded cases fluid has been found in the ventricles, and in others a small point of bone, as sharp as a needle, projecting from the internal surface of the os frontis or from the sella tursica.

Treatment.—As in adults so with children, this must have reference to the measures to be adopted during a fit, and those to be employed in the interval.

During the fit the patient should be laid on a large bed, air freely admitted around the head raised, and the necktie, together with any tight parts of the dress loosened. A piece of cork or soft wood should, if possible, be introduced between the teeth, to prevent injury to the tongue. Cold affusion to the head will sometimes be useful, especially if the countenance be turgid and congested. In cases preceded by the epileptic aura, the application of a ligature just above the part where the sensation is experienced has been said to prevent the attack.

In the interval we must endeavour to improve the patient's general health, and especially to give tone and firmness to the nervous system. Dr. C. B. Radcliffe, in his excellent *Comments on Convulsive Diseases*, has well shown that everything tending to depress the vital powers does harm. Mineral tonics, especially the salts of iron, zinc, and silver, are consequently to be employed. Arsenic is also a remedy which has great repute, and in some cases seems certainly to be of service, but its administration in children requires great care. Belladonna has been highly recommended by Brown-Séquard, Trousseau, and others, but we cannot speak favourably of it, as it has signally failed in our hands. There is, however, one remedy which we have certainly found to answer—viz., the bromide of potassium, in moderately large doses, five to ten grains to a child of eight or nine years of age. This drug has been more successful in our hands than any other, and we speak from an experience of several cases in which it has proved successful, not perhaps in actually curing the patient, but certainly in diminishing both the frequency and severity of the fits. The practice of subcutaneous injections of morphia has lately been recommended as very successful, but we have no experience of it, and on the whole, we are disposed to place most reliance upon the bromide of potassium, the sulphate of zinc, and arsenic. In cases of emergency a large dose of table salt has been found to ward off an attack.

The cold shower-bath may be especially recommended, if it can be borne, otherwise the tepid sponging-bath should be substituted; the diet should be simple but nutritious. Dr. West recommends abstinence from meat diet, affirming that he has "certainly seen epileptic fits increase in frequency and severity by an abundant meat diet, and diminish in both respects when a diet chiefly of milk and vegetables was adopted." The patient's habits must be regulated by such rules as common sense will dictate—daily exercise, early hours, and quiet amusements; while mental excitement or exertion is, on the other hand, especially contra-indicated. Backwardness in book-learning will prove no evil, when compared with the persistence of epilepsy.

XVI. ECLAMPSIA NUTANS.

Eclampsia nutans, or the "Salaam" convulsions of infancy, is an important but very rare malady—so rare that the majority of practitioners never see an example of it. It is probably a form of epilepsy; and like it may lead to impairment of the intellect. Thus of four cases—the histories of which have been collected by Mr. Newnham—two terminated in complete idiocy, and two in impairment of the intellect. The ages of the sufferers were 16 months, 4½ months, 12 months, and 6 months respectively.

Symptoms.—The pathognomonic symptom by which this affection is distinguished—and which induced Sir Charles Clarke to denominate it "Salaam" convulsion—is a peculiar, involuntary, rapid bowing forward of the head, and occasionally of the body; the bowings being repeated in rapid succession, and the attacks coming on in paroxysms several times daily. The more severe attacks usually come on in the morning on awaking from the night's sleep. After a time cerebral symptoms and general convulsions arise, or the case becomes one of pure epilepsy; there may be hemiplegia or paraplegia; the little patients pining and wasting away. After several months, the symptoms remit; and at the end of two or three years the bodily health may be partially restored. The causes of this affection are involved in obscurity.

Pathology.—Mr. Newnham believes that the essential character of this malady is inflammatory action of a weak or strumous character, commencing probably in the membranes investing the medulla oblongata, and extending to the membranes at the base of the brain. Hence exudations of lymph or serum occur, causing pressure, and consequent paralysis; the regular nutrition of the brain is interrupted, and its manifestations blunted; while in the more aggravated cases, the organ becomes so deteriorated as to lose all power of carrying on the intellectual functions, having probably been attacked by the same kind of inflammatory action as first appeared in its investing membranes.

Treatment.—The two chief points to attend to are these:—Keep the secretions in order by calomel in small doses, or by the hydrargyrum cum cretâ, or by aloes; and at the same time support the vital powers by bark, or by quinine combined with some preparation of steel. In the cases above referred to, hydrocyanic acid palliated the symptoms, while opium aggravated them: had chloroform been in use, it doubtless would have been tried, and might possibly have been of service.

Tepid or cold bathing will be useful, and so will a nourishing diet: the body must also be warmly clad, while the head is kept cool. All quick movements, and all harshness or anything which produces mental excitement should be carefully avoided.

XVII. CHOREA.

Chorea, or St. Vitus's dance, is characterized by incomplete subserviency of the muscles of voluntary motion to the will, giving rise to irregular, tremulous, and often ludicrous actions. It has been quaintly designated " insanity of the muscles."

The following table shows the relative frequency of chorea at different ages and in different sexes: the facts are made up from tables gathered from various sources.

Age.	Male.	Female.	Total.
Under 4 years . . .	42	66	108
From 4 to 6 years . .	100	141	241
„ 6 to 10 „ . .	409	900	1,309
„ 10 to 12 and 15 „ .	272	745	1,017
Total	823	1,852	2,675

Dr. Hillier shows in a table of cases admitted into the Children's Hospital that,—

Between 3 and 6 months there were 1 male and 2 females.
„ 6 „ 12 „ „ 1 „ 4 „
„ 12 „ 18 „ „ 1 „ 1 „
„ 18 „ 24 „ „ 1 „ 3 „

So that, as he remarks, the number of cases under two years of age is greater than is commonly supposed, and shows how, even at that early age, the predominance of the central nervous system predisposes to its merely functional derangement.

Symptoms.—This disease begins generally with twitchings of the muscles of the face, and by degrees all, or almost all, the voluntary muscles become affected; the child finds it impossible to keep quiet; there is a constant movement of the hands and the arms, and even of the legs; the features are most curiously twisted and contorted, and the articulation is impeded: these movements are, moreover, always most severe when the child is watched. Very frequently only one side or set of muscles is affected, speech is commonly impaired, and if the patient is asked to put out the tongue, there is inability to do so for some moments; at last it is thrust out suddenly and as suddenly withdrawn. Walking is simply advancing by fits and starts in a jumping manner, the legs are dragged along rather than lifted, and there is alternately halting and hopping. The patient cannot sit still; the shoulders writhe about, the feet shuffle and scrape the floor, and the fingers are constantly engaged in picking at the clothes. During sleep these irregular actions usually cease. When the disease lasts long, the countenance assumes a vacant appearance bordering on fatuity, and some imbecility of mind becomes manifest. Occasionally, the affected muscles become paralyzed, but this is rare; they usually recover themselves. If auscultation be practised a systolic murmur is often heard at the left apex of the heart. It generally passes away with the subsidence of the disease; we have, however, noticed that its advent in many cases was indicative of a severe attack. The functions of the stomach and bowels are also frequently deranged; the appetite is irregular; the abdomen swollen and hard; and there is often constipation. These symptoms, however, all cease on the termination of the disease, which is scarcely ever fatal, unless it merges into organic disease of the nervous centres, or into epilepsy.

Chorea may last from one week to several months; the average duration is probably five or six weeks. It it sometimes complicated with hysteria; and it has been observed to happen in conjunction with—or on the termination of—rheumatic fever, and rheumatic inflammation of the heart. Although most common in girls, boys also suffer from it.

Pathology.—Chorea may be merely symptomatic of some affection of the nervous centres of the heart, or it may be purely idiopathic: its pathology is very obscure. In the cases that have proved fatal, the only morbid appearances that could be discovered were pericarditis and endocarditis; in others, there has been congestion of the meninges of the spinal cord and sometimes inflammatory products; in a third class some organic affection of the brain or spinal cord, more especially softening; but in the majority no morbid change of any kind. Many authorities maintain that chorea and rheumatism, though apparently different diseases, depend upon some identical or analogous blood-poison. However this may be, it cannot now be doubted that some very intimate relation exists between them, and especially where the latter is associated with cardiac mischief. Dr. Howslip Dickinson has recorded 92 cases. Of these, out of 22 fatal cases 17 had heart complications; and of 70 non-fatal cases in 14 only were the heart-sounds natural. Dr. Miller noted 29 cases of cardiac complication in 37 cases of chorea; Dr. Hughes noted 6 in 10; and Dr. Ogle 10 in 16; Dr. West, who formerly doubted the connection, now admits that in 33 cases under twelve years of age, there was an undoubted rheumatic origin in 11, and our own experience fully bears out this view. What may be the explanation of this fact it is exceedingly difficult to say. Some have thought that the cardiac complication is only functional, that the murmur so often present is dynamic, and may possibly be due, in part at all events, to irregular action of the heart, to faulty contraction of its fibres, &c. This, however, is manifestly incorrect, for organic valvular disease has often been found, though at present the relation between the two diseases remains to be solved. It has been advanced by many eminent observers that the affection is due to *minute emboli*, conveyed either from deposits on the valves of the heart, or composed of small masses of aggregated white corpuscles impacted in the small vessels of the corpora striata and optic thalami and the adjacent convolutions. This is called the *embolic theory*. Dr. Dickinson noticed in the 22 fatal cases alluded to, that the choreic changes were confined to the parts between the beginning of the middle cerebral arteries and the corpora striata—the parta perforata; and in the cord, to the central portion of each lateral mass of grey matter comprising the root of each posterior horn. The corpora striata were affected with almost absolute symmetry. This fact would seem to dispose of the embolic theory, seeing the corpora are supplied with blood from two different sources. The nature of the lesion in the brain was that of vascular disturbance, and where the source of the hæmorrhage could be determined it was invariably due to arterial degeneration and peri-arterial sclerosis.

The most frequent *exciting cause* of chorea is shock to the nervous system, and especially that induced by fright or other mental emotion: the favouring circumstances are, hereditary nervous excitability, ill health, the rheumatic diathesis, a condition of anæmia, and functional derangements of the digestive organs.

As regards *Prognosis* it may be generally affirmed that the affection will terminate favourably. It is well, however, to remember that a recurrence of the attack is possible, and consequently, the liability to cardiac complications.

Treatment.—The bowels are to be regulated, nervous irritation subdued, and the system strengthened. For this purpose, the employment of cathartics of a stimulating nature is necessary; such as aloes, calomel and jalap, or—where worms are suspected—scammony or the oil of turpentine. A combination of tonic and antispasmodic medicines with purgatives, is often found to be serviceable.—As soon as the secretions have become healthy, a course of treatment calculated to give tone to the nervous and muscular systems is to be commenced; and the two great remedies for this purpose are the cold shower or douche bath, and some preparations of steel or other tonic. A great variety of tonics have been recommended, but in our experience none are more efficacious than the citrate of iron and quinine, to which we add arsenic; Dr. Hillier has spoken very highly of this remedy: in 12 out of 19 cases it proved serviceable after trial of only fourteen days. The sulphate and oxide of zinc, especially the latter, have also found staunch advocates, but their success in our hands has not compared with that from steel. We have also used largely, and with undoubted success, the bromide of potassium, in combination with equal parts of chloral hydrate; we have exhibited it in large doses following the advice of Dr. Robert Burges, and have obtained marked present abatement of the movements and a quick convalescence. Serpentary is a good nervine tonic, and sumbul is an admirable antispasmodic. Dr. Pierce has recommended the hydro-chlorate of apomorphia in a solution of one grain to 200 minims of water. He injects subcutaneously five minims of this solution, and repeats the dose on the third and tenth day. The good effects resulting appear to be due to the nausea induced. Dr. Russell Reynolds has advocated general electrization with the Faradic current. It is said that applying the ether spray to the spine daily has cut short the disease, and that the inhalation of chloroform acts in a similar manner. Enemata of chloral hydrate have been successfully administered. Dr. Dexter, of Chicago, being unable to effect any amelioration in a case becoming serious from the general failure of the vital powers, ordered the patient to be kept in a darkened room; to lie as still as possible; to be positively silent; and the attendants to maintain the strictest quietude. In conjunction with this valerian, cannabis indica, and bromide of potassium were given at bedtime. All choreic movement disappeared in six days. The treatment was based on the conclusion that as the sensori-motor centres were the seat of the disease, being in a state of asthenic irritation, they required physiological and therapeutical rest. Bouchut advocates the hypodermic use of eserine—the active principle of Calabar bean—in doses of $\frac{1}{28}$th of a grain repeated two or three times a day. He states that daily injection cured the disease in an average period of ten days. Bromide of iron will be found very useful. The bath should be employed every morning. Where the shower or douche bath causes alarm, or seems in any way to disagree, a warm sulphur bath, as recommended by many French physicians, will prove very efficacious. M. Sée strongly advocates this remedy, and states that of 57 cases in which he tried it, 50 were cured in about three weeks. The bath may be made by dissolving 4 oz. of the sulphuret of potassium in about 4 gallons of water. The diet must be nutritious, and there is no doubt that, especially among the poorer classes, many cases of chorea may be cured simply by good feeding, for the disease is so essentially one of defective innervation that probably no medicine will be of any avail unless nutrition is carefully maintained. Exercise in the fresh air should be freely allowed; indeed some of the French physicians have treated chorea with gymnastics alone, and with an amount of success fully equal to that obtained by any other method. M. Blache gives the result of 108 cases thus treated, 74 of which were of extreme severity; the number of exercises varied from 18 to 73, and the time occupied was from 26 to 122 days. Mental excitement should of course be guarded against, though we have known several instances in which the disease having begun by fright was cured by the same emotion. This, however, is obviously a remedy which scarcely admits of scientific application.

XVIII. PARALYSIS.

Infantile paralysis is by no means the same alarming affection as paralysis of the adult; for though often obstinate and occasionally incurable, it is seldom perilous to life. The effects, however, often occasion very considerable anxiety, and recent observations point to the existence of organic lesion in the brain or spinal cord, as far more frequent than was formerly supposed. For practical purposes, cases of paralysis in children may be grouped under three principal heads: 1. From organic disease of the central nervous system, the brain or spinal cord. 2. From blood-poisoning. 3. From eccentric irritation, or reflex paralysis.

1. Under the first head may be included most, if not all, cases of congenital paralysis, as these generally arise from some malformation, and it need hardly be added that such cases do not admit of treatment with any hope of success. So also caries of the spinal column may lead to disease of the cord, and to consequent paralysis. Here again little can be done by way of treatment. Lastly, there is the paralysis due to inflammation of the brain or spinal cord, to cerebral tumours, and tubercle.

2. The second variety refers to cases of paralysis which not unfrequently come on in the course of the eruptive or continued fevers, scarlet fever, measles, and typhoid fever, or in the course of diphtheria. These cases, as a general rule, recover, and the treatment of that upon which the paralysis depends is the best treatment for the paralysis itself.

3. Cases of eccentric or reflex paralysis are certainly by far the most common in children. They occur most frequently during early dentition, either in connection with it, or from irritation due to derangement of the digestive organs, constipation, the presence of worms, &c. Sometimes it arises from cold, there being no organic lesion. Possibly the term "reflex," as applied to some of these cases, is scarcely correct, but it will serve its purpose if the reader will understand by it that no organic lesion is discoverable.

To one or other of these varieties most cases of paralysis in childhood may be referred, but there are cases which seem by their history to suggest some other cause, though their real nature is still a matter of speculation. In them the loss of power occurs suddenly and does not afterwards increase, it is very often complete, and is generally unattended by any cerebral disturbance, may be limited to one limb or set of muscles, or may involve both upper or lower limbs; it generally leads to wasting of the palsied muscles, sometimes to deformity. The attack itself may begin in sleep, or may be ushered in by convulsions; sometimes there is a feverish attack at first, which, however, is only transient, and no other warning may be given. There is no pain, or any tenderness in the spinal column, except in a few rare cases where the paralyzed limb is also painful both to the touch and in movement. As a rule, sensation remains intact, or is somewhat dull, but there is no muscular rigidity or any reflex excitability. The sphincters are not affected.

If the paralysis continues, the affected muscles begin to waste, and their fibres to undergo a kind of fatty degeneration, "the transverse striæ disappear first, then the longitudinal markings; instead of the transverse striæ amorphous granules appear, which are soon replaced by distinct fat globules."

Such a history as this, and such symptoms, naturally suggest the idea of spinal mischief; nor is this at all improbable; but as the cases generally recover, there is no possibility of proof, and for practical purposes it is perhaps of little moment. On the other hand, the fact that the sphincters are not paralyzed, that the paralysis does not increase, but rather decreases, that sensation is not destroyed, or the temperature increased, all this is against the existence of spinal inflammation.

The evils which result from persistence of the paralysis are very great; for though it may never be followed by death, it produces such an alteration in the nutritive functions of the affected muscles, as often leads to incurable deformity. Not only do the affected parts cease to grow in the same proportion as the healthy, but the limbs waste, for they are imperfectly nourished: and although they do not seem to want sensation, yet their power of motion is lost or diminished. Consequently, if the child begins to walk, the leg drags; and as it fails to support the body, the child falls. Supposing one arm to be paralyzed, it will soon be noticed that it is not used equally with its fellow, and that when raised it falls by its own weight.

According to French authorities, spinal paralysis in children is due to atrophy of the grey anterior columns of the cord, especially in the cervical and lumbar enlargements, in which the largest motor-trophic ganglion-cells are found. Dr. Althaus states that it is produced by a diffuse acute inflammation of the anterior horns of the grey matter of the cord. He characterizes it as an extremely acute myelitis of moderate intensity, which is either diffuse or occurs in circumscribed areas: he adopts Kussmaul's term for the disease, and designates it, "anterior polio-myelitis." The right anterior horn of the lumbar enlargement is specially liable to the inflammation, hence the frequency of paralysis of the right lower extremity. Dr. Althaus defines the affection as "exclusively motor paralysis followed by muscular atrophy, to which is frequently added contraction and deformity."

The *Diagnosis* of the different forms of paralysis in childhood is not usually a matter of much difficulty if careful attention is given to the history of the case. In cases of cerebral paralysis, excepting those which are congenital, there is generally some previous history of brain disease, but in addition to this there are also differences in the paralytic and other symptoms. If the case be congenital we may be tolerably certain that it is due to cerebral causes. If it is not congenital, but if there have been rather severe and persistent convulsions, if the muscles be at all rigid, if they are easily excited by reflex irritation, if their temperature be rather increased than otherwise, if the paralyzed limb does not waste, and if the face be at all affected (provided it is not merely facial palsy), then the case is probably one of cerebral origin. And this probability will be heightened if the paralysis be hemiplegic—while, on the other hand, the converse of all this will be strongly in favour of a spinal origin.

As regards *Prognosis* this has reference much more to the probable duration of the affection than to the question of life or death; and, in forming an opinion, the time which has already transpired since the attack must be a main element of consideration, for it may be laid down as a general rule that the longer the disease has existed beyond six months the longer it is likely to last; in other words, the more difficult will it be to cure, and the more slowly will remedies act upon it. The two other points which should mainly guide our opinion are, the degree of wasting in the paralyzed limbs or set of muscles, and the effect produced on them by galvanism: if this be *nil* the case is a bad one, and *vice versâ*.

The *Treatment* must vary according to the cause. If any source of irritation can be discovered this should be removed if possible; and as worms are a not unfrequent cause of reflex paralysis, a dose of scammony or jalap and calomel, should be given; or an enema of salt and water or quassia infusion may be employed. We may also employ friction, and sometimes counter-irritation, to the spine. After the age of four years, the eighth of a grain of the spirituous extract of nux vomica may be given thrice daily, increasing the dose slowly till it reaches the third of a grain. In the acute stage of the disease, Dr. Althaus recommends the subcutaneous injection of ergotine. He employs a solution of Bonjean's ergotine in distilled water, and injects, generally in the legs, one-fourth of a grain for a child from one to two years; one-third for one from three to five years; half a grain for children from five to ten years; and a grain for patients above that age. The injections are to be repeated, according to the symptoms, once or twice a day. The temperature and the state of the pupil are the special guides. If the thermometer registers 103° or 104°, and the pupil be dilated, the dose may be repeated and increased. Its repetition should be delayed under other circumstances.

In all cases the general health is to be attended to, and the functions kept as nearly normal as possible; purgatives will often be needed, together with tonics, and nervine stimulants. The little patient is to be taught to walk while being supported in a go-cart, or in a baby-jumper; or, if old enough, by means of a pair of crutches. It is of the greatest importance that the muscles of the limb should be daily exercised, if possible, by gymnastics, shampooing, friction, &c.

Galvanism is one of the most valuable agents we possess in the treatment of children's paralysis, but it requires to be used with caution, and this in direct proportion to the amount of reflex excitability present in the paralyzed muscles. If no contraction follows its use, if the muscles are a good deal wasted and the case be one of very long standing, it is probably hopeless, and neither this nor any other remedy will avail to rouse the muscular sense.

In cases where there is reason to suppose that inflammation has existed, the iodide of potassium and the perchloride of mercury will be useful. Afterwards the iodide of iron, small doses of phosphorus, cod-liver oil, and the compound syrup of the phosphates (Parrish's Chemical Food) will be found beneficial. These have proved in our hands of signal service in those cases where the general health has been much affected and the muscles a good deal atrophied. Good diet, sea-air, and tepid bathing will also increase the chance of cure.

XIX. FACIAL HEMIPLEGIA.

This is an affection which is not unfrequently seen in infants soon after birth, and which is probably caused by some injury to the branches of the seventh pair of nerves, either by the forceps or from pressure during the passage of the head through the pelvis. The distortion usually diminishes in a few hours, and quite disappears by the end of a week or two, without any treatment.

XX. PSEUDO-HYPERTROPHIC MUSCULAR PARALYSIS.

In the year 1861, Dr. Duchenne described an affection characterized by a form of progressive paralysis accompanied by hypertrophy of certain muscles. The affection has since been recognized in this country by Dr. Langdon Down, Dr. Ord, and other observers. Its occurrence, however, is comparatively exceedingly rare From the cases recorded, there does not appear to be any assignable cause for the disease, either as regards hereditary predisposition, special diathesis, or acquiremen tfrom traumatism, or as a sequela of some severe disorder. It appears to attack the young and the male sex especially.

The *Symptoms* are those of general muscular feebleness. At the onset, a child, hitherto apparently healthy, is noticed to be somewhat weak about the limbs; this weakness steadily increases; the child then begins to fall down frequently without any cause, and the ability to raise itself from the ground gradually decreases as the disease progresses. Simultaneously with the increasing weakness, the calves of the legs become greatly enlarged and out of all proportion to the other parts of the body. In the erect posture, the feet are generally placed some inches apart, the toes turned out, the heels drawn up, the knees bent forward, the buttocks bent backwards, the spine curved forwards from the hips to the shoulders—making the chest and abdomen prominent—the shoulders thrown back, the head—relatively large as regards the body—is bent forwards, the muscles of the back are wasted, the right shoulder is generally contracted and drawn downwards, and its muscles, with those of the rest of the body, are more or less atrophied. When, however, we come to the calves of the legs, these are found to be greatly enlarged, standing out in marked relief as compared with those of the body generally. The child walks from the hips, shuffling the feet along the ground, the heels being raised, the toes turned in, and the trunk swayed from side to side. On the slightest touch, and often without any external impulse, it falls down, generally with the left leg flexed and the right leg extended, the body assuming a sitting posture. By the help of a chair or other support, it raises itself with comparative ease to the horizontal position, but it experiences difficulty in gaining the erect position from the weakness of the sacro-spinal muscles, hence a higher fulcrum has to be seized to raise the head and shoulders. All the muscles are sensible to Faradic electricity, the calves of the legs specially so. The temperature over the calves may be higher than that of other parts of the body. The increase in size of the calves has revealed a relative feebleness of their muscles. As remarked, the child attacked with the affection is in the enjoyment of good health. Further, the spécial senses have been found normal and the intellectual faculties unimpaired. No lesions of the viscera have been detected.

Pathology.—The disease has been referred to vaso-motor disturbance. Dr. Ord suggests that it may have its origin in the sympathetic nervous system outside the spinal cord and brain. He considers that the weakness rather follows faulty nutrition than paralysis of muscular nerves followed by wasting of the muscles. The high temperature occurring in the calves of the leg, he thinks, is due to hyperæmia, and he refers the subsequent overgrowth to causes affecting the nervous system.

Morbid Anatomy.—A microscopical examination of the tissues of the calf of the leg has shown that in the early stage there has been an excess of inter-muscular fibrous tissue ; later, that the muscular tissue has become attenuated, and degenerated, and intercepted by a growing quantity of fat ; and in the advanced stage, a large excess of adipose tissue between the muscular fibres. Dr. Lockhart Clarke and Dr. Gowers have examined the spinal cord of a marked example of this disorder. They found varied and extensive lesions from the level of the second cervical nerve downwards ; disintegration of the lateral grey network between the caput cornu posterioris and the tractus intermedio-lateralis ; a lateral half of the anterior white commissure destroyed and replaced by granular *debris*, exudations and extravasated blood globules ; the lateral and posterior white columns damaged by sclerosis ; and in the lower portion of the lumbar enlargement much injury by disintegration of the central part of the anterior cornu and the outer part of the cervix cornu posterioris. Very few nerve-cells could be seen in the anterior cornu about the level of the upper sacral nerves.

Diagnosis.—We have seen that in pseudo-hypertrophic muscular paralysis, the disease at first principally attacks the lower limbs and produces overgrowth with gradual enfeeblement. In *Progressive Muscular Atrophy* in the child, the disease advances from the face to the trunk and from the upper to the lower limbs; it destroys the muscles in an irregular but progressive manner, finally producing local and partial deformities. In *Infantile Paralysis* the attack is ushered in by fever or convulsions; the paralysis at first complete, tends to diminish, and is localised in certain muscles; the localisation may cause subsequent partial deformities of the limbs.

The *Prognosis* cannot but be unfavorable; though the child may survive to adult life, some inter-current affection, strengthened in its force by the feebleness of the system attacked, generally intervenes to destroy life.

The *Treatment* consists in raising the tone of the system, guarding against accidents, and in the application of electricity to the wasting muscles.

XXI. PROGRESSIVE MUSCULAR ATROPHY.

We are indebted to the observations of Cruveilhier, Aran, and Duchenne for distinctly differentiating this affection. It is characterized by the steady wasting of the muscles of the upper and lower extremities, or the trunk, but without loss of voluntary power. It generally attacks individuals of good physical development, and more especially those of the male sex. The exciting causes are hereditary predisposition, cold, excessive muscular action, and disease or injury affecting the spine.

Symptoms.—The invasion is gradual. At first, weakness is generally noticed in the ball of the thumb and hand; it may, however, be first observed in the shoulders, the tongue, the face, the thigh or foot. In the greater number of cases it is limited to one or a few groups of muscles in one or other of the extremities; in others, all the muscles may be successively attacked. The muscles of mastication and those that move the eyeball have hitherto been exempted. The wasting is gradual; little by little the affected limb loses its contour until it is reduced to skeleton proportions with a simple covering of subcutaneous tissue and skin. The atrophy of one set of muscles causes certain distortions by the lesser wasting of the opposed group. The hand is thus frequently affected by a peculiar deformity called the "claw-shaped" hand. The proximal phalanges are bent backwards from the bottom of the hand, and the middle and distal ones are semi-flexed. If the shoulders be attacked, the whole limb dangles powerless at the side. When the face is affected, the power of expression is totally lost, and the saliva pours from the mouth. Should the abdominal muscles be involved, the body is prominent, whilst the chest is thrown backwards. In cases of partial wasting, the order of the attack has been first noticed in the upper, then the lower extremity, and lastly, in the muscles of the trunk. The occurrence of a curious vibratile tremor is indicative of an extension of the disease. The atrophied muscles respond to electric stimulus, and there is no loss of tactile sensibility. There is usually some neuralgic pain. The general health, the functions of the body, and the intellect are usually unaffected.

Pathology.—In uncomplicated cases it is "assumed that the morbid process is strictly limited to the nutritive centres in the cord or to their connections in the sympathetic ganglia. In the complicated cases it may be assumed that the morbid process radiates into those contiguous parts of the cord which control the motor and sensory functions."

Morbid Anatomy.—The affected muscles are seen to be more or less atrophied or completely destroyed, and varying degenerative changes have been observed in the spinal cord and the nerves.

Diagnosis.—In atrophy from injury to a nerve, the lesion is confined to the parts supplied by that nerve. In lead palsy, the history, the colic, and the blue line on the gums are pathognomonic. In pseudo-hypertrophic paralysis the affection is limited to the lower extremity and produces an overgrowth with gradual enfeeblement.

The Course, Duration, and Prognosis.—The disease is essentially chronic and its duration is uncertain. It may end in recovery, permanent arrest, or terminate fatally, according to the nature of the exciting cause, the progress of the wasting, and the group of muscles invaded.

Treatment.—Any known cause must be removed. There should be methodical exercise, change of air, and regular bathing in warm water. Galvanism is the most potent remedy. The neuralgic pains may be relieved by morphia. If a syphilitic taint be the cause, mercury and iodide of potassium must be employed.

XXII. HYPERÆSTHESIA.

We would just refer to this temporary disorder of the nervous system. It may occur in the course of dentition, or be a precursor of motor paralysis. It is most marked in the lower part of the trunk and the inferior extremities. Children affected with it will not allow themselves to be moved or handled for the ordinary purposes of washing or dressing. The attempt even to touch them has elicited a sharp cry of agony. In cases of dentition a tonic treatment of iron, quinine and wine has proved beneficial; whilst in those preceding paralysis the disorder has passed off with the pronounced invasion of the disease.

XXIII. NEURALGIA.

We are indebted to Dr. West for calling attention to the not unusual occurrence of this affection in childhood. The subject is fully treated in his Lumleian Lectures. Any slight over-fatigue or excitement produces severe headache. The attack is sudden, lasting from twelve to twenty-four hours, ceases spontaneously, and leaves no sequelæ. Its non-progressive character, the cessation of symptoms, and the absence of effect on the general condition of the body will differentiate it from cerebral or meningeal tuberculosis. As there is generally some gastric disorder marked by photophobia and intolerance of sound, a mild aperient will often cut short the attack. The treatment, however, to be adopted is the early administration of quinine, or other tonic, the special indication being the improvement of the general health.

XXIV. MENTAL DERANGEMENT.

By the term *Mental Derangement* as applied to children we include, not only all those cases of undoubted insanity which we now and then meet with in children, but even those milder cases of mental hallucination, of malingering, of hypochondriasis, and of morbid exaggeration of trifling ailments, which children occasionally exhibit.

It cannot be doubted that the mental disorders of childhood have not had that attention bestowed upon them which their importance demands. This is to be regretted for many reasons, but especially because upon their early recognition and proper management depends all hope of their successful treatment. Moreover, as Esquirol remarks, "The existing causes of insanity do not act abruptly, except when the patients are strongly predisposed; almost all the insane exhibit, before their disease, some alterations in their functions, alterations which commenced many years previously, and even in infancy. The greater part have had convulsions, cephalalgia, colics, or cramps, constipation, and menstrual irregularities." Thus we see the extreme importance of an early recognition of these mental peculiarities; it is not of passing moment only, for the result in any given case may influence the whole future life.

On the other hand, mental derangement in childhood by no means necessarily affects the child's future career, for, as in the case of adults, the derangement may last only for a short time, be slow or sudden in its outset, and pass away for ever. Paulmier believes that this is the rule, but Delasiauve and others hold that where mental disease has once shown itself there is a special predisposition to its return in after-life, and Brierre de Boismont regards the whole subject of mental derangement in children as one of the gravest importance.

The peculiarities of the mind in early life are perhaps even more numerous, and are certainly more important, than those of the body; and they impart certain characteristic features to the mental disorders of this period. "A child's experience," says Dr. West, "is small, his ideas are few, and those are gathered from the world around him, not from his own reflections; while one impression succeeds another with greater rapidity than his feeble memory can hold fast. Hence, in disorders of the mind in early life, we do not meet with the distinct hallucinations, the fixed ideas, which characterize insanity in the adult. But though the intellectual powers are imperfectly developed, the feelings and the impulses are stronger, or, at least, less under control, than they become with advancing years; and one great object of education is to bring them into proper subordination. Mental disorders then show themselves in the exaggeration of those feelings, the uncontrollable character of those impulses; in the inability or the indisposition to listen to that advice or to be swayed by those motives which govern other children. The affection, in short, is of that kind to which the name of moral insanity is generally given. With this state of mind, however, the child is of course less teachable than others—less able to apply to any form of learning; while fits of passion or of sullenness, sometimes for days together, put a stop to every attempt at instruction. The disorder of the moral faculties thus reacts upon the intellect; the child learns but little, and consequently grows up ignorant, as well as ungovernable; till at length either the evidences of insanity become with its advancing years unmistakeable, or, the mind growing more obtuse from want of culture, the case sinks down into one of mischievous idiocy."

The frequency with which children exaggerate some little ailment or feign some disease, renders it necessary that the physician should always be upon his guard: for to allow himself to be deceived is to produce cruel mischief, and to lay the foundation for the subsequent development of all kinds of hallucinations. In a case which gave rise to a good deal of anxiety, inasmuch as no signs of morbid action could be discovered to account for the severe sufferings complained of, some disgrace was incurred by the opinion given, after a careful review of the history and symptoms, that there was no organic disease, and the ailment was mental rather than physical. That this opinion was, however, correct, though doubted by the friends, was proved by the child's improvement soon after she was removed from the influence of her parents, who spoilt her; and upon diverting her thoughts to higher objects of interest than the condition of her own body. The treatment which was here adopted is in fact that which is indicated in most cases of this kind; and which will very often be successful when combined with kindness, and at the same time determination, gentle mental discipline, healthy amusement, a cessation of sympathy and lamentations over the ailment, and attention to the general health—by exercise in the open air, a nourishing diet, strengthening baths, and perhaps the administration of cod-liver oil. We need hardly add a caution to the effect that the mind is not to be overtasked in combating the evils described. To rush from the extreme of too little attention to the education to too much, will only be to perpetuate the evil or to increase it:

hence a tutor or governess of sound common sense should be chosen, and the nature of the case must be explained in all its bearings. Moreover, the child should not be sent to a school; but what is better, into some quiet family, where constant control and supervision will be exercised by some person competent to engage the child's affections, to enter into its pursuits, and to share its pleasures.

Another manifestation of mental disturbance not unfrequently occurs in children, and from its leading feature goes by the name of *night terrors:* a young child goes to bed quite well, but two or three hours after it has been asleep, or perhaps in the middle of the night, it suddenly awakes in great alarm, and utters loud cries. Its attention seems absorbed by some frightful dream—probably about a bear or a dog, or some animal which is thought to be in the bed; and for a few minutes it fails to recognize its nurse or parents who have been awoke by the noise. After having been soothed and taken into the nurse's arms, it crys and sobs, then gradually becomes quiet and falls asleep: and probably the attack does not return until one or more nights afterwards. Seizures of this kind are generally due to some sympathetic cerebral irritation induced by disturbance in the intestinal canal: they must not be confounded with those attacks which are owing to sudden and severe pain, such as arise in the course of some chronic affections of the ear. In treating these cases, the grand point is to regulate the functions of the abdominal viscera, and to relieve the constipation which generally exists. A combination of mild aperients with tonics—F. 199, 206, 261, 266—will often effect a cure; especially if the diet be at the same time simple, nourishing, and digestible. The child's cot should be placed by the side of the nurse's bed; the child should not be left alone; a fire or a candle should be kept burning in its room; and great kindness should be shown to it, when it awakes with this mental torture.

The *varieties* of mental derangement in children are almost as numerous as those in the adult. Hallucinations are by no means infrequent; homicidal mania is also occasionally met with; Marc says. "We have seen homicidal mania manifest itself during the first years of life; thus age, considered by itself, cannot be any true guide in regard to mental disorders." Esquirol also mentions several cases of this kind.

Kleptomania is another manifestation of mental disease which is occasionally met with in children, and Steiman mentions a case, apparently hereditary, in which a boy three years of age was addicted to this, for "he stole all kinds of eatables within his reach, although he always had plenty to eat, and only needed to ask for whatever he wished." Suicidal mania appears to be even more common among children; of 41 cases, recorded by different authorities, there were—

1 at 5 years.
3 „ 9 „
2 at 10 years.
5 „ 11 „
10 at 12 years.
11 „ 13 „
3 at 14 years.
6 „ 15 „

Drowning and hanging appear to be the favourite means adopted. Pyromania, though less frequent, is not very uncommon among children under sixteen; thus, we find that of 26 cases which occurred under twenty years of age, no less than 15 occurred before the age of sixteen. Mania is very rare, but does occasionally occur, for a case in a child only six years of age, was admitted into the Bethlem Hospital. Insanity, which is undoubtedly very strongly hereditary, sometimes, though rarely, manifests itself during early life, and for this it is not absolutely necessary that the parents should have any insane tendency; for many other diseases of the nervous system in the parent may lead to insanity in the offspring, such as epilepsy, and even phthisis, fright or other mental shock during gestation, malformation of the brain either congenital or acquired during the progress of delivery, the milk of a woman with a strong predisposition to insanity, and various accidents and complications of dentition, especially convulsions; all these have a very manifest tendency to the development of insanity in childhood, and it seems more than probable that many of the mental peculiarities in children which are often set down to faults of temper and evil disposition, are in reality neither more nor less than manifestations of mental derangement, requiring not merely moral discipline but medical treatment.

In the management of these cases it is of the utmost importance first of all to correct any disorder of the *primæ viæ;* for this purpose a mercurial alterative will generally be found of great service. This should be followed by some gentle aperient, the action of which should be maintained for a few days. After this, tonics, combined with a generally sedative and soothing plan of treatment, will be found to answer best.

XXV. IDIOCY.

Idiocy is unhappily of more common occurrence in children than any of the phases of mental derangement we have considered. It has been defined by Esquirol as a "condition in which the intellectual faculties are never manifested, or have never been developed sufficiently to enable the idiot to acquire such an amount of knowledge as persons of his own age, and placed in similar circumstances with himself, are capable of receiving." It is often congenital, and then doubtless is associated with some imperfect organization; but it may arise during infancy from causes acting after birth.

When congenital, the head is very commonly microcephalic, but this is by no means universally so. In a large proportion of cases there is a very marked want of symmetry between the two halves of the brain, and it is curious to note that the intelligence of the idiot seems to be in proportion to his *occipital* development, that part being extremely small in all idiots.

Whether congenital or not, the following seem to be among the principal characteristics: there is a want of symmetry in the head, or an unusually brachy-cephalic, dolicho-cephalic, or micro-cephalic form of it; an open frontal suture; a fold at the inner canthus of the eye, called the epicanthic fold; an oscillation of the eyeballs, or so called mystagmus; an ill-formed condition of the lobule of the ears, with a position far back in the head; a large or rugose tongue; an obtuse angle to the lower jaw; a lax or sodden skin; a tendency to spina bifida or vaulted or cleft palate; automatic movements or spastic rigidity (Dr. Langdon Down); the mind remains undeveloped; there are few or no ideas; the manners are childish; the countenance is vacant, and devoid of intelligence; the features are irregular, the forehead is low and flattened; the lips are thick, and the mouth is large and often gaping; the child is subject to transient gusts of passion, and there is generally timidity, obstinacy, and a want of affection; often a keen greedy appetite. The articulation is always imperfect, and the power of speech may even be absent; there is very frequently partial or complete deafness; and the child can hardly be taught to walk till much after the usual time, nor even then except by great patience. In regard to speech and hearing, however, we must make very careful inquiries on these points, for otherwise we may attribute to cerebral deficiency what is in reality merely a curable form of deafness. Very commonly there is inability to use the hands properly, or to lay hold of objects firmly; the period of dentition is later than usual; and frequently there is some bodily deformity, such as imperfect conformation of the cranium, with rickets, goître, dwarfed stature, &c. There is a class of cases, scarcely so marked as these, to which the term idiot can hardly be applied. They are in fact more imbecile than actually idiotic, and not only is there this difference in the degree of intellectual power, but the case of the imbecile is distinguished in other ways from that of the idiot. Idiocy is almost always congenital; imbecility is very rarely so: the former seldom exhibits that destructive tendency which is not infrequent in the latter; again, imbeciles often show an amount of moral sensibility and preception far beyond that which the idiot possesses, and out of all proportion to his intellectual capacity. In 2,000 cases reported by Dr. Langdon Down, the ratio of males to females was 2·1 to ·9.

Among the *Causes* of idiocy and imbecility may be mentioned primogeniture, difficulty of parturition, suspended animation, twin births, maternal vomiting during gestation, neurotic constitution, external impressions, chronic alcoholism, procreation during a debauch, congenital malformation of the brain, severe mental shocks, such as fright, which seems capable of arresting cerebral development, injury to the brain by a blow or otherwise, fits, such as epilepsy, convulsions, &c., blood-poisoning, as in some febrile conditions, cerebral atrophy, however brought about, inflammation of the brain, and certain hereditary influences, such as scrofula, syphilis, and, it is said, marriages among near relations;—masturbation has also resulted in mental imbecility.

The *Prognosis* is affected by the causes producing the idiocy. The cases due to congenital or developmental defects are more amenable to training than post-congenital cases. In the one we have to deal with an ill-developed brain, and, in the other, with a damaged brain. A distorted face is a more favourable sign, than bright looks and comeliness. The earlier the training, the better the future of the child.

In regard to *Treatment* there are, happily, in all, or nearly all cases, at least the rudiments of the intellectual and moral faculties; and it is by kindly fostering and educating these rudiments and by cultivating such aptitudes and good inclinations as may be manifested, however slightly, that the poor idiot or the imbecile can be taught to control his animal appetites and propensities. Even in the more serious congenital forms of this affection much can be done.

M. Sægert, of Berlin, has indeed in some of the lowest types of idiocy effected wonderful changes by educational exercises, developing faculties which seemed to be quite absent, and so fitting those who were destined to spend their lives in seclusion for some social enjoyment. So marked, indeed, are the results which he is able to achieve, that the increased cranial development is made apparent even to the most ordinary observer.

In like manner, Dr. Maxwell, speaking of the inmates of the Asylum for Idiots at Earlswood, says: "I think I may say that *all* have improved more or less. Kind treatment, good diet, and attention, will improve the most hopeless cases. Many that come in dirty, irritable, &c., not only become cleanly, but get to speak intelligently, to dress themselves properly, and to make themselves useful. Other cases will do a great deal in the school; for instance, we have a case which came in spiteful, obstinate, and unable to read and write. Now he reads well, writes well, also writes from dictation, draws very nicely, and can sing several songs, plays on the harmonium, and can drill, which has made him walk upright. He has latterly been in the mat-making shop, and can make the best part of a mat. Another boy has *improved* in all the above, and is learning mat-making. He possesses, perhaps, the most intellect of any of the boys, but I cannot say that I think he will ever be like an ordinary person. The cases most favourable are those between seven and twelve, which are healthy, can speak, and are free from fits and paralysis."

It must not, however, be thought that nothing can be done for these cases except to look after their mental and moral training; much may also be done in the way of physical education, and something too by medical treatment. Our object being above all to improve brain nutrition, remedies which are believed to possess this power should be given, and we know of none more useful than the compound syrup of the phosphates or "Parrish's Chemical Food;" where there is also a good deal of torpor, we have added with apparent advantage the æthereal tincture of phosphorus, two to five minims for children from two to five or six years of age; cod-liver oil is another remedy of value, and stimulants should also be given pretty freely. There is another remedy (?) which may be mentioned here, though it scarcely admits of practical application, but several cases are on record in which a severe blow or other injury to the head has been known to cure idiocy. Thus a case is mentioned by the late Dr. Forbes Winslow of a child who, up to the age of thirteen was perfectly idiotic; he then met with an accident and fell upon his head from a height; he was completely stunned at the time, but upon recovering his consciousness, he was found to be in full possession of his intellectual faculties! Many cases similar to this are on record, but though curious they can hardly be said to be instructive, for we cannot tell what to learn from them, and certainly cannot improve our therapeutics by them.

XXVI. CRETINISM.

Cretinism has so many features in common with idiocy that its study may fitly be considered here. It is a disease having a special affinity for certain localities, and is found principally in the valleys of the Alps, the Pyrenees, and the Himalaya mountains: regions where the soil is damp; the air humid and foul, from being shut in on all sides by high mountains; and the inhabitants dirty, poor, and often almost destitute of the common necessaries of life. It is, however, occasionally, though very rarely, met with in a sporadic form, isolated cases having occurred in England and elsewhere. Cretinism is essentially a disease of early life, and according to the best authorities is thought to be mostly congenital, though its characters are not sufficiently marked at the time of birth to enable us to distinguish them. Of 4,888 cases, 4,440 occurred before the second year, 187 between the second and fifth year, 202 between the fifth and twelfth year, 31 between twelve and twenty, and 28 from twenty and upwards.

The *Causes* of cretinism appear to be chiefly, if not entirely, of climatic origin, the soil, the atmosphere, and the water being the three principal agents, acting in conjunction with a bad diet upon a depraved and vitiated constitution. Sir John Forbes believed that it was essentially of miasmatic or malarious origin: others have attributed it to scrofula, to rickets, and some to a poisonous principle emanating from the soil and acting upon the nervous system as a miasm.

Symptoms.—The following are the principal characters of the cretin;—his stature is diminutive; his head of great size; the countenance vacant, and void of intelligence; the tongue large; the flesh flaccid, brown, and dirty looking; figure squat and bloated, seldom exceeding four feet in height, even in adults, and often not more than three feet; the abdomen is sunken and pendulous; and the legs are short and curved. Idiotism of the lowest grade is frequently his lot; sometimes he is dumb, or deaf and dumb, or blind; in all cases his disposition is sluggish and unexcitable, and his muscular energy at the lowest point; his appetite is gross and voracious; his sensual propensities are sometimes very disgusting; and, in short, if neglected, he more resembles an animal than a human being.

Some authors have divided cretins into three classes:—In the first and worst kind, the victims of the disease seem only to possess the vegetative functions, being destitute alike of reproductive and intellectual faculties. In the second, these faculties are possessed to a limited extent. In the third, the reproductive faculty exists in comparative perfection, and though the intellectual faculties are exceedingly low, they can be cultivated so as to permit the sufferer to follow some kind of occupation.

There is one very interesting and important question in regard to this disease—viz., as to the possibility of *Diagnosis* in its very earliest stage, that is, at or soon after birth. When once it is fully established, no mistake is possible, for there is no other disease which at all resembles it in its twofold aspects of mental and physical deformity. According to Brierre de Boismont, the following characters may be noted as generally present in well marked cases at about the sixth month. The head is large, the fontanelles and sutures are widely separated, the mind appears even then to be a blank, and the expression of the face is in keeping with it; development proceeds very slowly, yet the child is stout and puffy looking, the belly large, the limbs thin, the neck short and thick, and the skin dirty looking. Subsequently, dentition is arrested or greatly delayed, speech is imperfect or altogether absent, the eyes have a vacant expression, and are sometimes affected with strabismus, the zygomatic arch is as large as the mouth and lips, the thyroid gland is very large, and the child is unable to stand.

Kohl states that there is a peculiar dulness of the eye by which experienced people can tell whether or not the child is to be idiotic. But sometimes there is no appearance whatever of this disease until even as late as eight years of age; then the countenance becomes stupid and heavy, the gait awkward, the legs bend, and the memory and intellect seem to vanish. If no improvement takes place, the condition above described is gradually developed, and confirmed cretinism results.

In regard to *Treatment*, thanks to Dr. Guggenbühl—the humane and talented director of the establishment at Abendberg, near Interlachen, for the treatment of cretins—it has been proved that even for these apparently hopeless cases much may be done by incessant supervision; combined with pure mountain air; plenty of exercise; a simple nourishing diet into which milk largely enters; the occasional use of such medicines as cod-liver oil, carbonate of iron, or better still the preparation of the compound syrup of the phosphates, known as "Parrish's Chemical Food," which is so valuable in cases of deficient nerve power and faulty nutrition of the nervous centres, phosphate of lime, valerianate of zinc, &c.; warm clothing, and attention to the functions of the skin; moral control, and judicious mental training.

Cretins often live to a great age. They are kindly treated by their neighbours; and in some villages are superstitiously regarded as sacred beings.

CHAPTER II.

DISEASES OF THE RESPIRATORY SYSTEM.

INTRODUCTORY REMARKS.

It is scarcely possible to overrate the importance of a careful study of the diseases of the respiratory apparatus as they manifest themselves in the young; for not only do they give rise to very painful symptoms, but such is their fatality that—according to the Registrar-General's Report for the year 1876—out of 90,034 who died from diseases of the respiratory organs at all ages in England, no less than 40,938 occurred under five years of age; while the total number of deaths from all causes under five years was 206,553. In London alone, out of a mortality from all causes under five years of age, of 33,081, no less than 7,225, or nearly one-fifth of the whole, were due to diseases of the respiratory organs.

Regarded only from this point of view, their importance might well have given their consideration precedence even of that of the diseases of the nervous system; but, as we have said in our introductory remarks to the latter, we preferred to take these first, from the fact that all other diseases so powerfully influence the nervous system, that the phenomena due to the latter often mask those which are of really greater moment as being primary and essential, in opposition to what is secondary, and, as it were, accidental. Of none, perhaps, can this remark be made with greater force than of some of the diseases of the respiratory organs, especially those of an acute inflammatory character, which are often ushered in with the most marked and apparently severe disturbance of the nervous centres.

We have already (vide pp. 51–66) remarked upon some of the physiological peculiarities of the respiratory organs and functions in early life. The remembrance of these will help us to understand some of their pathological tendencies. And happily, though absolutely more fatal as compared with the mortality of the diseases of the nervous system, diseases of the organs of respiration are relatively less so, having regard to their greater frequency. This is probably due to the fact that, from the means at our command, these are more easily diagnosed, and therefore admit of being more surely treated.

We propose to consider these diseases in the following order:—1. Those occurring in the upper part of the respiratory tract, including coryza and catarrh, croup and diphtheria, spasm of the glostti and pertussis. 2. Those occurring in the lower part of the respiratory canal—bronchitis. 3. Those attacking the serous membrane—pleurisy, hydrothorax. And 4, those occurring in the substance of the lung itself, pneumonia, gangrene, œdema, and phthisis. But before entering upon the study of these affections, there is one other condition of the lungs which it may be well we should here briefly allude to, inasmuch as it not unfrequently occurs in connexion with pulmonary disease—viz.,

I. COLLAPSE OF THE LUNG.

This affection was formerly supposed to be due to inflammation, and the term lobular pneumonia, meaning thereby inflammation of small isolated and scattered patches of lung tissue, was used to describe it. The researches, however, of Legendre and Bailey, in the year 1844, established beyond doubt that the disease in question was really no inflammation whatever, but a state of collapse due to obstruction in the pulmonary air-cells and minute ramifications of the bronchial tubes.

The *Anatomical Peculiarities* of pulmonary collapse are those which would perhaps be best described by the term which was formerly used to designate this condition—viz., carnification: the part in question is solid, firm and tough, does not float in water, is dark purple or brown in colour, contains some mucus but no air, and differs from the lung in pneumonia by the fact that when inflated it expands again with more or less facility, and then resembles healthy lung tissue.

The most common seat of this condition is the middle lobe, or the anterior margin of the lower lobe of the right lung, and the posterior margin of both lower lungs, but why this is so is not known. It may affect only a minute portion of one lobe, or it may affect the whole of one or more lobes.

There is no doubt that this state is frequently brought about by some obstruction in the bronchial tubes, by which air is prevented from entering the air-cells, while at the same time the proper elasticity of the lung tissue leads to a collapse of the parts bèyond the obstruction. But besides this mode of production, the same thing may be brought about by mere exhaustion and consequent inability to expand the lung; hence it occurs sometimes in cases of diarrhœa, of fever, rickets, phthisis, and other exhausting dieases. The most frequent of all causes, however, is bronchitis, the viscid mucus alone preventing the proper inflation of the lung. Dr. Gairdner, who has paid great attention to this subject, arrived at these two conclusions: 1. That in all cases of collapse of the lung, as well in adults as in children, which are not caused by external pressure, the bronchi have presented unequivocal appearances of obstruction. 2. That in most, if not all, the instances of severe and fatal bronchitis, especially if the secretion has become ropy or inspissated, more or less collapse of the pulmonary tissue has been present.

The *Symptoms* of pulmonary collapse are, dyspnœa, which is in proportion to the amount of lung involved; this generally comes on rather suddenly, and should therefore excite suspicion whenever it occurs in connection with any of the diseases above mentioned; dulness over the collapsed portion, and absence of all respiratory murmur are the chief physical signs. In some cases, bronchial breathing occurs when the collapsed lung is near the surface.

In regard to *Treatment* nothing is more clear than that extreme weakness is at the root of the evil, consequently our efforts should be directed first to clear the bronchial tubes by stimulating expectorants, such as ammonia, senega, and squills; to relieve them further by rubefacients and other counter-irritants externally; and give such tonics and stimulants as will best support the patient.

II. CORYZA.

During the first month or so after birth the mucous membrane lining the trachea and bronchi does not appear to be so susceptible to the influence of cold as it afterwards becomes; while, on the other hand, the Schneiderian membrane lining the nostrils appears to be readily affected by very slight causes. Hence coryza, or nasal catarrh, is a common affection among infants a few weeks old.

Symptoms.—Coryza is usually ushered in with slight febrile disturbance, sneezing, running from the eyes, and slight discharge of thin mucus from the nostrils; while owing to the tumefaction of the mucous membrane of the nares, each inspiration is accompanied by a peculiar snuffling or snoring noise, and the infant is obliged to breathe chiefly through its mouth. If the attack be severe, respiration through the nose will be altogether prevented; and the infant will then be unable to suck, inasmuch as directly he closes his lips round the nipple he will be compelled to quit it, to escape suffocation. Thus, the uneasiness produced by the general disturbance will be increased by the sense of hunger; so that unless the plan of feeding with the spoon be resorted to, great exhaustion and emaciation will speedily result.

Occasionally, the inflammatory action is more violent and extensive, giving rise to pseudo-membranous exudation; or to an abundant secretion of tenacious mucus from the Schneiderian membrane. The symptoms are then of a much more dangerous character; and as the vital powers are a good deal depressed, this form of the disease has been termed *coryza maligna.*

Causes.—It is probably due to cold and damp, the surface of the child being in some way chilled: neglect in keeping the infant clean and dry may give rise to it. It is sometimes a forerunner of one or other of the eruptive fevers: and occasionally it appears to be connected with a syphilitic taint, in this case, however, it has special characteristics which will be found described at page 152.

Treatment.—Slight attacks require but little treatment beyond attention to the clothing and the maintenance of the child in a tolerably uniform temperature, so that he may be kept warm. These attacks generally subside spontaneously in the course of a week or ten days. When there is any difficulty in sucking, the milk should be drawn off, and the infant fed with it by the aid of a spoon. In severe cases of a malignant type, when there is great prostration of strength, the patient must be supported by stimulants, tonics, and plenty of nourishment; a few small doses of mercury will be sometimes beneficial, especially when the disease becomes chronic; while the tendency to the formation of false membranes in the nasal passages is to be combated by local injections of alum—gr. 10 to the ounce of water, or of nitrate of silver—gr. 3 to one ounce of water, but especially by supporting the strength of the patient. In all instances care should be taken by cleanliness and the use of a little cold cream to prevent the discharge from forming any dry crusts at the orifices of the nostrils, as these only increase the irritation, obstruct the breathing, and are a source of great distress and discomfort.

Cases which are decidedly of syphilitic origin will best be cured by a mercurial course, but as this is only one symptom of a general dyscrasia it will be better to consider it in connection with the subject of syphilis.

III. CATARRH.

Sometimes the inflammation, which in coryza is limited to the nasal mucous membrane, extends further down the respiratory tract but yet scarcely reaches the bronchi; it affects the eyes, nose, throat, and upper part of the trachea, and gives rise to that group of symptoms which we recognize under the name of *catarrh.* It is in most cases the result of what is called "taking cold;" but very much the same symptoms are sometimes produced by an irritation acting sympathetically on the respiratory mucous membrane from some distant part, as during the process of dentition.

In itself the catarrh of childhood is not an affection of much moment, but inasmuch as its accompanying inflammation has a strong tendency to proceed down the bronchial tubes, and thence even to the lung tissue itself, it ought always to be very carefully watched and treated, lest bronchitis, or even pneumonia, result. The age at which catarrh most frequently occurs is one characterized by a peculiar sensitiveness of the whole mucous system, hence it is that so much care is needed, and that the *Symptoms* sometimes assume great severity.

There is generally some slight febrile disturbance to usher in the attack, hot, dry skin, alternating with a chilly, creepy kind of feeling, quick pulse, and increased frequency of breathing. Very soon the affected mucous membrane secretes abundance of watery mucus, and there is a rather free discharge from the eyes and nose in particular, accompanied by sneezing and short dry cough. In severer cases the constitutional disturbance is still more marked, the child is heavy and dull, and there is sometimes so much fever that suspicion of measles or some more serious pulmonary mischief is aroused. Hence the necessity in all cases for great watchfulness and care in the management and *Treatment* of even common catarrh.

Above all things it is necessary to secure an atmosphere of uniform temperature for the child to breathe. He should also be carefully clad in warm clothing, be kept in one room, and if a moist air can be obtained in it, as from the steam of a kettle, so much the better. The warm bath will also be of great service, both as a derivative and as restoring the often suppressed action of the skin. Warm and slightly stimulating drinks should be given frequently, and the diet should be mostly liquid though nourishing.

As medicines, stimulating diaphoretics, such as ammonia and camphor, with demulcent drinks, will be the best. If the cough be troublesome and there is much secretion, some paregoric will be of service; if but little secretion, squills, and possibly, where the child is of gross habit, ipecacuan, antimony, and the liquor ammoniæ acetatis will answer best.

In the milder forms probably no treatment at all will be necessary beyond that included in the general term of good nursing.

IV. CROUP.

Cynanche trachealis, tracheitis, or croup, are terms which have been given to an inflammatory disease of the trachea—often of the larynx and trachea; ending, in the majority of cases, in the more or less abundant exudation of false membrane upon the affected surface.

In connection with the definition of croup, there is one very interesting point of inquiry, which may be fitly considered here—viz., as to the relation which this disease bears to diphtheria. It cannot be doubted that in many features of their clinical history, as regards symptoms, morbid appearances, origin, progress, and termination, there is a very close similarity between them; but, on the other hand, it must be admitted that there are conditions frequently present in the one which are extremely rare in the other, and these form prominent and almost characteristic features of the two diseases. It may perhaps serve to make the matter more clear, and enable us the better to arrive at a definite conclusion on this subject, if we first enumerate the various symptoms commonly present in the two cases respectively; after which we shall be able to compare these, and to see wherein they seem to differ, and in what to agree.

Croup is one of the most serious diseases of childhood: it is most common perhaps during the second year of life; nearly 40 per cent. of the deaths from croup occurring before the age of two years, and is comparatively rare after the fifth: it occurs more frequently in male than in female children, though why it should do so cannot be well explained: when a child has once suffered from it, there is a liability to a recurrence of the disease at any time up to puberty, but the second attack is usually less serious than the first: occasionally it appears to prevail as an epidemic; and it is often complicated with bronchitis and pneumonia.

Symptoms.—In describing the symptoms of croup, first of all we may conveniently make an artificial division of the disease into three stages—viz., the precursory, the developed, and the stage of collapse, or of threatened suffocation. The *precursory symptoms* are those of a common cold; with slight fever, thirst, a hard hollow cough, hoarseness, drowsiness, suffusion of the eyes, and running at the nose. In some few instances the child clutches or rubs its larynx, as if there were some uneasy sensation there; or there may be a slight hesitation in swallowing, as in simple sore-throat. If we examine the fauces, however, no traces of disease will be found; and if we resort to auscultation or percussion, the chest will be found healthy. At the end of twenty-four or thirty-six or forty-eight hours *the second or developed stage* sets in. The child is suddenly awoke—almost invariably at night—by a sense of suffocation, with a peculiar acute, dry, ringing, brassy cough, and hurried breathing. He is agitated and alarmed, and wants to sit up, or leave his bed; his face becomes slightly swollen and flushed, and his eyes are suffused and bloodshot. Each inspiration now becomes prolonged; and is attended with a characteristic crowing noise, readily recognized when once it has been heard. These distinctive coughs, with the difficult and crowing inspirations, probably continue in paroxysms through the remainder of the night: while the little sufferer continually changes his position to find that relief which is denied to him. As the morning dawns, however, there is a slight remission of the symptoms, and a short sleep may be obtained. But the improvement is only transitory, for the disease advances, the fever increases, the voice becomes more hoarse, the paroxysms of cough more frequent, and the breathing more hurried and difficult; there is also great thirst, the tongue is coated with a thick fur, the pulse gets quicker and harder, and the child is very irritable and restless. It is now very commonly noticed that the child seizes his larynx as if to remove some obstruction; then the arms are thrown wildly about, and all covering is tossed aside; the countenance becomes flushed, and at times almost livid. As each paroxysm of cough comes on, and the dyspnœa becomes urgent, the head is thrown back as far as possible, in order to increase the capacity of the windpipe.

Through the whole progress of the disease exacerbations are observed to take place at night, with remissions in the morning: the cough is unattended by expectoration, and each fit of coughing is usually followed by a paroxysm of dyspnœa; the act of speaking seems to increase the suffering, for the child only whispers, and often refuses even to utter a word; the bowels are constipated; and although the appetite is quite lost, there is a constant desire for drink, notwithstanding that deglutition sometimes causes pain.

As the disease advances towards *the third stage, that of collapse or threatened suffocation*, the intermissions between the paroxysms grow shorter, so that there is scarcely any remission; the cough gets more difficult, less audible, suppressed, and strangulating; the voice is nearly or quite abolished; the croupal respiration is permanent; and every now and then suffocation seems imminent. Moreover there is drowsiness, which soon becomes extreme, though the sleep is uneasy, and the child starts and wakes in terror and grasps convulsively at any object near him. If no relief be given by the expectoration of the muco-purulent matter, or of the membranous exudation obstructing the larnyx and trachea, the skin becomes cold and covered with clammy sweats; the pulse gets very quick, feeble, and intermitting; the respiration grows more difficult, and is accompanied with a hissing noise; the movements of the larynx are forcible and incessant; the head is thrown back, the alæ nasi are rapidly dilated and contracted, the eyes are dull and sunken; the complexion is livid; and the countenance is expressive of the greatest agony. At the end of about twelve or eighteen hours the child dies with signs of convulsive suffocation, or it sinks exhausted into a state of coma, from which death ultimately relieves it.

The practice of auscultation in the second and third stages yields information as to the amount of air entering the lungs, and the extension or not of the inflammation to the bronchial tubes and lungs. When the obstruction to the entrance of the air is great, the inspiratory murmur may be quite imperceptible in the smaller bronchi, except during an unusually deep inspiration after a fit of coughing; at the same time there is healthy resonance on percussion. According to Barth and Roger (in their *Traité pratique d'Auscultation*, p. 261, 3rd ed., Paris, 1844), a kind of vibrating murmur or *tremblotment* can be heard over the larynx or trachea, when the false membrane has become partially detached and is floating; but this murmur is seldom to be detected.

Should bronchitis supervene, we shall find the sonorous rhonchus indicative of it masked in some degree by the croupy noise in the trachea; and such will be the case with regard to the small crepitation of pneumonia. But in the latter case there will be impaired resonance on percussion over the inflamed portions of lung. Abscess of the larynx may simulate croup.

Now, in regard to *Diphtheria*, the symptoms most commonly present are these. At the very outset of the disease there is an amount of depression which is out of all proportion to the concomitant symptoms, seeming to show that the nervous system has been prostrated by some blood-poison. There is, at the same time, some febrile disturbance, though at first it is certainly less than in the case of croup, owing no doubt to the fact that in the one case the inflammatory symptoms have begun sooner than in the other. In a very little while the tonsils, uvula, and pharynx are seen to be very red, and small patches of lymph are observable upon them. Soon the breathing becomes difficult, and it is evident, perhaps in a very few hours, that the windpipe is becoming involved, for the difficulty of breathing increases. Then the glands about the neck and throat swell up, the tongue is very red at the tip and edges, and covered with thick white fur at the back. Gradually, or perhaps speedily, the back of the mouth and throat becomes covered with thick flakes of lymph, the breath is horribly offensive, and the voice is suppressed almost suddenly; but still there is no great difficulty in deglutition. Generally, but in some cases much more than in others, there is a good deal of nasal discharge, with the ordinary symptoms of severe catarrh, running at the eyes and nose, and sometimes false membrane forms there, which may be limited to this one part.

As evidence of the profound manner in which the system is affected, it may be noted that in a large majority of cases albuminuria occurs in the course of a few days, seldom before the fifth day, the urine at the same time being remarkably scanty and high coloured. In severe cases there is almost total suppression of urine, and then the result is invariably fatal. It is not accompanied by any dropsical symptoms.

Lastly, there is frequently observed, though by no means so generally as in the cases of albuminuria, paralysis, either of some set of muscles, or of a still more limited character. The period at which this symptom occurs varies greatly, as does the amount of the paralytic phenomena. In some instances it seems to be limited to the heart, the action of which becomes remarkably feeble and slow; as in the case recorded by Sir W. Jenner, that of a young girl, in which the number of beats amounted to only sixteen in a minute. In other cases the frequency of respiration is involved, the breathing becoming exceedingly slow and laboured. In others again, deglutition is impaired or made almost impossible by palsy of the pharynx. In others, strabismus occurs. Lastly, the paralysis may affect the muscles of one or more limbs, those of the lower being more often affected than the upper; and sometimes there is a general weakness about the muscles of the trunk, the patient being unable to sit up.

Such then are the main features of these two diseases, if they be really two diseases: and it will be observed that diphtheria differs from croup, in regard to symptoms, mainly in two points—viz., the occurrence of albuminuria, and the paralysis. Other points of dissimilarity may be mentioned, such as the greater frequency of diphtheria in adults, and the non-contagiousness and non-epidemic character of croup.

But it must be remarked in reference to all these points—1. That in mild cases of diphtheria there is often no albuminuria, while in severe cases of croup it is not infrequently present. 2. Paralysis is frequently absent even in rather severe cases of diphtheria. In France it is said that paralysis is present in at least one-third of the cases, while in England it does not occur more frequently than in ten per cent. of the cases. Therefore it might be argued that, at least in those cases where this symptom is absent, there is nothing essentially distinguishing it from croup. 3. In regard to croup seldom or never attacking adults, while diphtheria frequently does, this can hardly be relied upon, because the same may almost be said of scarlatina. Lastly, we know that croup does sometimes occur epidemically, and if it be not contagious, so neither is it certain that diphtheria, when it attacks a number of persons in the same house or locality, is really communicated; for the fact may be due to the exposure of those affected to the same influences and at the same time.

In regard to the frequency of the different varieties of paralysis, Maingault, who has published a valuable essay on this subject, says that according to the results of 90 cases observed by himself, in 70 the pharynx was affected; in 64 the paralysis was general; in 39 amaurosis occurred; in 13 paraplegia; in 10 strabismus; in 9 the muscles of the trunk and neck were palsied: in 8 there was paralysis of sensation without motion; in 6 the rectum was paralyzed, and in 4 the bladder.

The date at which the paralysis occurs is by no means uniform; in some it happens when the disease is at its height, in others not until the period of convalescence begins. Nor is its occurrence at all proportioned to the severity of the attack, for it occurs sometimes in even the mildest cases. That its appearance is due rather to the effect of the general blood dyscrasia than to any merely local change either of the nerves or muscles of the parts affected, seems clear from the clinical history, and most of all from the fact that the paralysis may be very extensive, involving even all the muscles of the trunk.

The mode of accession of paralytic symptoms varies, but they generally come on gradually, and are often preceded by numbness and a tingling sensation in the parts affected. This of course only applies to cases affecting the limbs and trunk.

Pathology.—From the foregoing it seems evident that this disease is characterized by inflammation of the mucous membrane of the larynx, trachea, pharynx, or nares. This gives rise to a peculiar product—a pseudo-membranous secretion. The question as to whether the inflammation is of a simple kind, or depending upon some specific poison in the system—as is the case with the eruptive fevers, &c.—has been entertained but not satisfactorily answered:—our own views are certainly in favour of the latter opinion: the occasional prevalence of the disease in an epidemic form seems to indicate a specific agent as its cause. When simple laryngitis is excited in children by some poisonous irritant, or by drinking boiling water from the spout of a tea-kettle, the results are very different.

In that case, false membranes are not exuded, even though the inflammation extends to the trachea. Cases of croup though rare in adults do sometimes occur, but the symptoms are different from those of simple laryngitis, and they do not yield to the same treatment—*i.e.*, to making an artificial opening into the windpipe—which sometimes cures the latter. Again, if laryngitis be artificially produced in the lower animals, false membranes are not exuded; but croup—identical in its phenomena and organic changes with the disease in the human subject—does spontaneously occur in animals, as is seen in lambs, calves, puppies, cats, and chickens—constituting the "pip." The latter especially often prevails epidemically in a farm-yard, and produces a high mortality.

Having regard, then, to all that has been adduced as to the clinical history, the symptoms, and post-mortem appearances, there seem to be strong grounds for believing that diphtheria and croup, if not identical diseases, have at least very much in common. It is quite true that croup principally affects the larynx and trachea, while diphtheria attacks the pharynx and fauces, but inasmuch as diphtheria sometimes attacks the larynx, why may not croup conversely attack the pharynx, in other words, why may it not be croup when the pharynx alone is involved? This would seem to make the similarity complete. At any rate we must admit that both are blood diseases.

Occasionally diphtheria attacks the skin, principally about the neck, more rarely the exudation appears on the vagina, and sometimes it seizes upon the nares, whence it exudes backwards to the larynx. When it attacks the skin it mostly picks out abraded surfaces, ulcers, blisters, and the like.

When croup occurs during the course of scarlatina anginosa, the exudation thrown out from the inflamed surface forms a layer which covers the fauces and extends down the pharynx as well as down the air-passages; occasionally this follicular exudation is only formed in patches, giving rise to an appearance of thin sloughs. The inflammation may originate in tonsillitis, thence extending over the fauces, and down the pharynx and larynx. Occasionally there are aphthous ulcerations about the mouth and palate, especially when the disease occurs in feeble subjects, who have been previously suffering from disordered states of the alimentary canal. When the disease supervenes upon measles, small-pox, or erysipelas, the inflammatory fever assumes a low type, convulsions are frequent, the difficulty of respiration is excessive, and the paroxysms of suffocation are extreme. Lastly, the inflammation and exudation upon the larynx and trachea, may extend to the bronchial tubes, and thence to the substance of the lungs—giving rise to pneumonia; a complication which in almost all cases terminates fatally.

The *Diagnosis* of this disease is not as a rule very obscure, for the history of the attack, the hoarseness or loss of voice, the dry ringing cough, the early severity of the symptoms, the exacerbations and remissions, the croupal inspirations, the inflammatory fever, the heaving of the thorax, and the motions of the larynx and trachea, distinguish this disease from every other. It can indeed only be confounded with simple laryngitis; but this affection occurs principally in adults, very rarely in children, except when it is associated with croup; it then causes a fixed burning pain in the larynx, which is increased by any examination; it does not give rise to the exudation of false membranes; and—if prolonged—it ends in suppuration, or ulceration. The diagnosis between croup and spasm of the glottis is very simple: in the latter there is an absence of fever and of the peculiar cough; the intermissions between the fits of suffocation are complete, and there are general convulsions, with spasmodic contractions of the toes and thumbs during the seizure, but there is no inflammation and no exudation. This peculiar product is indeed quite pathognomonic both of diphtheria and croup. From scarlet fever it is easily distinguished by the absence of any rash, by the peculiarly red tongue of scarlatina, and by the greater pain in the throat and difficulty of deglutition in the latter disease. From œdema of the larynx, by its rarity in children, and by examination of the superior part of the aryteno-epiglotic folds. From the introduction of foreign bodies, by the history of the case, the absence of fever and the other symptoms enumerated. From retro-pharyngeal abscess, by examination of the throat. Finally it is a most dangerous complication of measles.

Prognosis.—Croup may terminate in—1. Recovery. This result may be expected in mild forms, when the respiration is comparatively quiet during the intervals between the paroxysms of cough; when the cough is loose, and followed by the expectoration of muco-purulent matter, or of fragments of the membranous exudation; when the disease is uncomplicated; and when it is not attended with great prostration of the vital powers. 2. The disease may give rise to some other malady, and this will materially increase the danger. In addition to the obstruction of the respiration produced by the exudation of croup, the disease sometimes causes spasmodic closure of the glottis; thus inducing—through the fits of suffocation which result—great pulmonary congestion. The extension of the inflammation to the bronchi and to the substance of the lungs is a very unfavourable event, and must always be regarded with the gravest anxiety; it is generally soon followed by lividity of the face, drowsiness, cold clammy sweats, rapid and full pulse, and suffocating paroxysms of cough with very short intermissions. Sometimes, just as the active signs of the attack are subsiding, a relapse takes place, and the condition becomes a much more alarming one: this tendency to relapse should make our prognosis guarded for at least two or three weeks, and particularly in weakly, delicate, and irritable children. Lastly, congestion of the brain, giving rise to the effusion of serum into the ventricles, convulsions, &c., may be an indirect consequence of croup, as of any disease which is accompanied by so much difficulty and distress of breathing. Dr. Copeland and others have met with cases of hydrocephalus following the disease, but they are certainly not common. 3. In the greater number of cases, it is to be feared, this disease ends fatally. And certainly danger is always to be apprehended when the symptoms progress to the third stage; when the fever from the first is high; when the attacks of dyspnœa are frequent and severe; when the cough is not followed by expectoration; when the pulse is frequent, small, and irregular; and when the countenance becomes livid, the eyes sunken, the features contracted, the tongue dark, and the lips covered with sordes—all these are symptoms indicative of great exhaustion. But perhaps the two most severe symptoms, those which occasion the greatest anxiety and lead to the most unfavourable prognosis, and to which we have before alluded as being usually regarded as indications of diphtheria and not croup, are, paralysis and albuminuria. There can be no doubt that these are very grave indications of blood-poisoning, showing how profoundly the system is, as it were, saturated with it.

Predisposing Causes.—Croup is more frequent in cold, damp, changeable climates, than in warm regions: hence it is common in the north-west countries of Europe, but almost unknown in the south. It is also prevalent in low moist localities; in the winter months and in the early spring; and especially perhaps after the long continuance of heavy rains with east or north-east winds. In regard to age, by far the greater number occur before the fifth year, and more between the first and second year than in any succeeding. Children of a nervous and sanguine temperament, but who are at the same time fat, strong, and well, seem more disposed to the disease than others; but when it occurs during the first twelve months of life it is seen most frequently in weakly infants brought up by hand. Boys are more liable to it than girls, perhaps—though this is very doubtful—because they are more exposed to its exciting causes: of 3,367 cases which we have collected from France, Germany, and America, there were 1,869 boys and 1,498 girls. In England the proportion seems to be about as 3 to 2. Some authors imagine that an hereditary tendency to croup often exists; others, that the disease is infectious; but the only support of these opinions is derived from the circumstance that two or more children in the same family are often seized with it, forgetting that they have been placed under the same circumstances as regards the exciting causes. There is but little doubt that though croup usually occurs as a sporadic disease, yet it sometimes prevails as an epidemic; and perhaps it did so more in former times than in the present day.

As regards the immediate or *Exciting Causes* of croup very little is positively known: but it is probable that habitual exposure of the neck and throat to cold, insufficient clothing, and such circumstances as induce common catarrh and bronchitis, will under certain other conditions give rise to it.

Morbid Anatomy.—The mucous membrane of the parts specially affected, be it larnyx, trachea, pharynx, or bronchial tubes, is generally found acutely inflamed, red or livid, congested and swollen: sometimes there are abrasions or ulcerations: and generally there either is a layer of viscid muco-purulent matter, or more commonly an exudation of false membrane. This membrane is found more frequently in the larnyx than in the trachea, and in both more often than in the bronchial tubes: on the Continent, more frequently than in this country, the exudation is found on the tonsils, the velum palati, and in the fauces and pharynx; it is these cases chiefly which are classed under the head of diphtheria, but the description would obviously be equally correct, whether they were called cases of croup with pharyngeal complication, or cases of diphtheria. In like manner if the term diphtheria be used to the exclusion of the word croup, then the former would be cases of diphtheria, with laryngeal complications. In short, as far as morbid appearances are concerned, there is no characteristic difference between the two cases. Generally the exudation presents the appearance of a thin but rather firm layer containing granular corpuscles, free nuclei, altered epithelial cells, and occasionally pus globules. It consists, for the most part, of albumen and fibrine, but in some cases, especially those regarded as diphtheria, there is no evidence of albumen obtainable. Signs of bronchitis and pneumonia are not unusual: but care must be taken not to confound the appearances due to pulmonic congestion arising from the suffocative influence of croup, with the results of inflammatory action.

Complications.—Lagrave has tabulated the following lesions met with in croup and diphtheria:—

Vegetating acute endocarditis with fibrinous deposits; nodules of pulmonary apoplexy or sanguineous infarctus in the lungs, with small venous thromboses between their lobules; sanguineous infarctus beneath the pericardium, between the impaired fibres of the heart and in the subcutaneous cellular tissues; venous thrombosis in the pia mater, brain, in the sinuses of the dura mater, in the liver, and other parts of the body. In malignant diphtheria he enumerates myocarditis, proliferating endarteritis, and parenchymatous nephritis. He calls special attention to the cardiac complications which frequently exist in diphtheria, producing symptoms which may simulate attacks of dyspnœa from obstruction of the trachea.

Treatment.—In no disease, probably, is it more necessary to be prompt, cautious, and unwearying in our attendance. Even where an attack of croup is merely apprehended in a child having a catarrh and slight rough or ringing cough, we should carefully watch the patient, place him in a warm bath for ten or fifteen minutes, confine him to bed, keep the air of the apartment moist, by the evaporation of boiling water, allow only a spare diet, and administer an emetic

(F. 108, 116). Different writers recommend different drugs as emetics; some prefer the sulphate of copper, others the sulphate of zinc, others again the sulphate of alumina. Some writers speak very highly of the Sanguinaria Canadensis; the late Sir Duncan Gibb especially recommended it. The first of these remedies finds the greatest favour on the Continent, and is very extensively used. Hornerkopff gave it in 99 cases, of which 77 recovered. He gives from one to 4 grains dissolved in water, and repeats the dose if necessary according to the age of the patient and the effects produced. At the end of four hours the bath may be repeated, and draughts of a saline mixture containing small doses of antimony or of ipecacuanha may be given—F. 132, 142—unless the symptoms are relieved.

When the inflammatory action is established, there are three remedies on which all authorities teach us to rely—viz., blood-letting, tartar emetic, and mercury. Perhaps there is no infantile disorder which is so surely and early recognized by practitioners, and so zealously and perseveringly treated on this plan, as croup; for mistakes in diagnosis are very rare, and errors in treatment are seldom committed,—supposing that the authorities are correct. The question may well be asked then—How is it that the disease is so fatal? We believe, from our own experience, because one of the chief agents is not only inappropriate but mischievous. Every physician knows that when he is summoned to a consultation on a case of croup, he is sure to find that the sufferer has been freely bled, either generally or locally; and he probably is informed that *in spite* of the loss of blood the inflammation increased. It never strikes the practitioner that he should say—"in consequence of;" yet it would probably be nearer the truth. We would strongly urge, then, that this plan of indiscriminate bleeding be discontinued; that the case be fairly looked at in all its bearings; and that the sufferer's constitution and the condition of his vital powers be fully taken into consideration. We are taught, as a rule, to bleed very freely when the child is plethoric and robust, full of blood, full of life, healthy and vigorous, with all its powers active. But are these the children who—generally speaking—suffer from this disease? Certainly not in town practice. And again, will bleeding make impure blood pure, or will it check inflammation? Is conjunctivitis controlled by the application of leeches round the orbit? Does the vascularity decrease as the blood flows? We have never seen it do so. In rheumatic fever, is it not those that have been bled which are most liable to be affected with pericarditis and endocarditis? Do women who have had natural labours suffer most frequently from puerperal metritis, or such as have had severe floodings? According to our own experience undoubtedly the latter. In short, we would counsel every practitioner to think and reason for himself: to scan every case of inflammation narrowly, and ask himself—Is there an excess of healthy blood here? and, even if there be, will it not be required by-and-by to support the system under the prostrating effects of the disease? and finally—let him consider well the result which has followed the employment of depletion when he has resorted to it himself, or has witnessed its employment in the practice of others, and if he find that the good derived from the use of the lancet has been more than problematical, then we would advise him to throw the instrument away, let authorities say what they may.

Our antipathy to the employment of venesection is increased rather than diminished by the thought of the probable identity of croup and diphtheria; in either case, however, not only is the disease itself, or that blood poisoning which is its issue, certain to depress vital power, but the effects of the disease also, such as the difficulty and distress of breathing, and the general febrile disturbance, are of a very depressing character.

But if we are not to bleed in a very severe case of croup, what are we to do? When the patient is seen at the onset of the disease, the inflammatory action may sometimes be arrested by hot fomentations alone—as recommended by Dr. Lehmann, and successfully practised by Dr. Graves. A good large sponge, dipped in water as hot as the hand can bear, should be applied over the larynx; the temperature being maintained by re-soaking it every two or three minutes. A steady perseverance in this plan for twenty or thirty minutes produces vivid redness of the skin over the whole surface of the throat; while under the influence of this topical treatment, a gentle perspiration breaks out, and this should be encouraged by warm diluents. A notable diminution also takes place in the cough, hoarseness, tone of voice, dyspnœa, restlessness, &c.; and very often sound sleep is induced, from which the patient awakes nearly well.

Supposing, however, that improvement does not take place, we must then resort to emetics—a most valuable class of remedies. The ipecacuanha wine—in doses varying from one drachm to two drachms, according to the age—should be given every fifteen minutes until free vomiting has been induced: and unless the breathing is relieved, a dose sufficient to keep up the nausea should be repeated every three or four hours until decided ease is afforded. When this is obtained, great benefit will result from the administration of a draught containing a little citrate of potash, antimony, ipecacuanha, &c.—F. 145—every two or three hours; repeating the emetic of ipecacuanha every eight or ten hours according to the symptoms. In cases where prostration appears to be coming on, an emetic of alum or of sulphate of copper—F. 115, 116—will be preferable to the ipecacuanha: while a mixture containing ammonia and senega—F. 138, 140—may be substituted for the antimonial medicine.

At the same time that this plan is pursued, the temperature of the body is to be taken by a thermometer placed under the armpit, or with care under the tongue; and if—as it usually is in the first and second stages, the degree of heat is above the normal standard, a warm bath ought to be administered, and the patient immersed in it up to the chin for fifteen or thirty minutes according to the effect produced. It is of course clear, that a patient having a temperature of 104° or 105° Fah., must part rapidly with some of this heat, if placed in water warmed only to 96° Fah.; unless as fast as the heat is given off it be renewed. This bath is not only cooling, but sedative: it may be repeated twice or thrice in the twenty-four hours, but only under the personal superintendence of the practitioner. To avoid alarming the child, the bath should not be prepared in his presence; and when brought into the sick-room the top of it should be covered with a blanket, on which the patient can then be placed and slowly lowered into the water. A piece of wood or some toy may be floated on the surface, to engage the attention of the little sufferer.

Supposing that the disease advances notwithstanding these measures, or supposing that we only see the case when it has reached the end of the second stage, the iodide of potassium with, especially if there be much depression, the decoction of senega—F. 25—will be found most valuable remedies. The application of the compound tincture of iodine to the outside of the windpipe, about once in every twelve hours, often does good; and provided that it does not raise a blister, it can do no harm. If the practitioner has any faith in mercury for preventing the formation of small membranes in croup, we need not omit the iodide of potassium, but may combine with it mercurial inunction, half a drachm or even a drachm of the ointment being gently rubbed in every four or six hours. Calomel may also be given as a purgative—if required—in doses of one, two, or three grains. In all cases, if the powers of life are failing, wine and strong beef tea must be frequently given; the iodide of potassium mixture being likewise continued, unless there are special reasons to the contrary. Should it be deemed advisable to aid the expectoration of the false membrane by an emetic, the best that can be administered during the third stage of croup is the sulphate of copper—F. 115. The value of this drug is supported by a great many authorities, and there is no doubt that it is extremly useful in this disease. Squills in the form of oxymel is also very valuable, especially in the milder varieties of the affection. Dr. Condie of Philadelphia strongly recommends the muriate of ammonia in all inflammations attended with diphtheritic effusions; he gives it in doses of three or four grains, with calomel and henbane. Chamerlat also recommends it as almost a specific when used as a topical application. Dr. W. Nelson, of New York, advises the local application of persulphate of iron in mild cases, he adds equal parts of glycerine. Bromide and iodide of potassium, the vegetable alkalies, liquor potassæ, lobelia, sanguinaria canadensis, senega, large doses of cubebs and copaiba, musk, and other so called antispasmodics, have each and all had their advocates, and there can be no doubt that great good has resulted from their use.

Dr. Horace Green, of New York, in his *Observations on the*

Pathology of Croup, &c., New York, 1849, has strongly recommended the application of caustic to the inflamed surface. He relates some cases which seem to show that a solution of the pure crystal of nitrate of silver—20 to 80 grs. of the salt to one fl. oz. of water, applied by means of a sponge probang, not only to the fauces, but into the cavity of the glottis—is often of great service. There are other remedies which we have found very useful as local applications—viz., the perchloride of iron and glycerine, or the muriated tincture of iron; these we have several times employed, and apparently with great benefit. The false membrane, if already formed, speedily separates, and the surface beneath bears a more healthy aspect after it. Where there is also fœtor, the preparation of carbolic acid and glycerine of the new Pharmacopœia, will be found very efficacious in correcting this; the throat should also be gargled with diluted Condy's fluid or with a carbolic acid lotion, one part to forty.

Dr. Johannet, of Chelles, insists on the incessant washing out or gargling of the throat, *both by night and day*, until the false membrane is so modified that danger seems to be averted. He uses water, wine and water, or alum and water. As soon as the patient can swallow, he induces him to eat something, anything he likes. Sometimes he prescribes a solution of perchloride of iron (1 part in 30 parts of water) to be applied by teaspoonfuls every hour, and to be followed immediately by a mouthful of cold milk. In young children he injects the fluid by means of the ordinary syringe, either into the mouth, taking care to press on the base of the tongue, or by the nasal fossa when the child offers too great a resistance to the opening of its mouth. In the intervals of the washings, which should be performed every hour, the child is made to swallow water or cold milk incessantly. Dr. Johannet bases his treatment on the hypothesis that the fauces can no longer secrete the false membrane from the moment that the liquid of the throat is changed and the temperature is lowered. Oertel recommends a stimulating treatment internally. He gives cognac with simple syrup or syrup of orange peel, in the proportion of one of cognac to two of syrup, quinine, chloride of iron dissolved in a mixture of one part of ether to three of alcohol (Bestuscheff's tincture), musk, castor, camphor. He remarks that the diphtheritic affection of the mucous membrane is an exudative inflammation, from a simple catarrhal exudation to that of a fibrinous effusion, or, further, may lead to mortification of the tissue through the amount of inflammatory products and of micrococci. The false membranes are detached, when nature is unaided, by the agency of suppuration. Thus the absorption of putrifying substances and the entrance of micrococci are prevented by a thick layer of pus-corpuscles, which at first infiltrate the superficial portions of the tissue, and ultimately, pressing forth from it, form a separating stratum of pus on the surface of the mucous membrane. On these grounds, he condemns local blood-letting, cauterization (the attempt to dissolve the pseudo-membranes chemically), and the application of ice, as absolutely hurtful, and affirms that the mechanical detachment of the false membrane only results in the production of small wounds of the surface of the mucous membrane, thus more readily affording an easier entrance of vegetable parasites and products of decomposition into the tissues, and, as an immediate result, a rapid reproduction of the false membranes over a larger area, owing to the increase of local inflammation and fibrinous exudation. He deems that the problem to be solved is the obtaining a rapid and abundant production of pus so as to cause a demarcation between the regenerating tissue of the mucous membrane and the false membranous layer. To this end he has successfully employed moist warmth in the form of hot vapour, conducted as hot and abundantly as possible into the mouth of the patient. If a rapid and free suppuration be required the inhalations must be carried out as often and as long as possible in quarter-hour sittings every half hour, and nourishment must be given in small portions in the intervals. The question of sleep, for the first two days, must be secondary to the continuous application of the hot vapour. To oppose septic infection and general poisoning of the system Oertel advises the use of antiseptic gargles of chlorine-water, permanganate of potash, carbolic acid, and oil of thyme. Sabbata advises a gargle composed of pure sulphate of iron, 77½ grains, dilute sulphuric acid, 25 drops, and water, 3 ounces. As a local application, only 2 ounces of water are to be added. He remarks that the solution completely destroys the characteristic fœtid odour. Internally he prescribes the hyposulphite of soda and tannate of quinine.

One of the most important questions in connection with the treatment of croup relates to the performance of tracheotomy. That this is a perfectly justifiable proceeding, no one can doubt, for many lives have been unquestionably saved by it, which, humanly speaking, must otherwise have been sacrificed. As regards the cases in which this is applicable, no more definite rule can be laid down than that, where death seems imminent from asphyxia, and there is reason to believe that the obstruction is limited to the larynx and upper part of the trachea, in such a case laryngotomy or tracheotomy is required. Ausculation should always be resorted to beforehand, for if pneumonia exists, as it is apt to do, that is almost a reason against the operation, for this disease is pretty sure to extend after the operation.

The great advocate for tracheotomy in the last stage of croup was M. Trousseau, who stated that during the last four years of his life he had operated twenty-four times in private practice with fourteen cures, and two hundred and sixteen times at the Hôpital des Enfants Malades with forty-seven recoveries. This result will appear still more favourable if allowance be made for the miserable state in which the children are generally taken to the hospital, and the unfavourable condition of the hospital itself. In private practice, M.

Trousseau believes that half the operations performed will be successful, always provided that tracheotomy takes place when the chances of cure are possible. This restriction is important; for if the diphtheritic infection is thoroughly rooted in the system; if the skin, and particularly the cavities of the nose, are invaded by this special phlegmasia, as is often the case in France; if the quickness of the pulse, delirium, and prostration indicate a profound poison; and if the danger is rather in the general state than in the local lesion of the larynx or trachea, certainly the operation should not be tried, for it is invariably fatal. When, however, the local lesion constitutes the principal danger of the disease, no matter to what degree asphyxia has arrived, even when the child seems to have only a few moments to live, tracheotomy very often succeeds. The double canula should be employed, and as large a one as can conveniently enter the trachea.

Dr. Marshall Hall suggested that when the operation had to be performed before instruments could be procured, it might be done with a simple pair of pointed scissors. The integument, being taken up horizontally by the thumb and finger of the left hand, should be divided longitudinally by the scissors; these should then be promptly forced into the trachea, to the proper depth, to be opened horizontally to the required extent; the scissors must then be turned, being kept in their place, and opened in the longitudinal direction: the operator has thus made, in a very short time, an opening through which the patient may breathe until further appliances can be obtained. Life depends meanwhile upon his steady hold of the instrument. Dr. Hall advised that instead of the canula, a simple instrument called the tracheotome be used to keep the edges of the wound apart. In whatever way the operation be performed, when completed, the most urgent thing to attend to is the feeding of the child; for, under the influence of abstinence, the absorption of external miasmata as well as of the vicious secretions formed within the body is favoured, and the power of resistance is enfeebled. Milk, eggs, chocolate, and broths form the most suitable diet. According to Trousseau, all medicinal treatment should be discontinued, as interfering with due alimentation: and if blisters have been previously applied, they must be healed. With this opinion we entirely concur; though it should be mentioned that the late Dr. Fuller, of St. George's Hospital, attributed the failure of tracheotomy in croup, in this country, to the abandonment of the antiphlogistic and mercurial treatment after the operation. Between the canula and the skin a small strip of oiled silk or caoutchouc should be interposed; and the nurse should be taught to remove and cleanse the inner canula every two or three hours. The neck should be surrounded by a large piece of muslin, and the child should breathe through this, so that the inspired air may become impregnated with some of the warm vapour furnished by expiration. The surface of the wound is to be pencilled daily with nitrate of silver, to prevent the formation of thick fœtid false membranes on its surface.

Sometimes after the operation there is a difficulty in deglutition, owing to the passage of fluids through the glottis, and their penetration into the trachea and bronchi, creating great irritation. Besides this irritating effect, the child acquires an invincible disgust for its food, and will die rather than take nourishment. The best means of remedying this is to avoid liquid diet, giving solid or semi-solid substances; at the same time allaying thirst by a little cold water, given just before or long after the repast, so as to avoid exciting vomiting. The inconvenience usually commences three or four days after the operation, but it rarely continues longer than from the tenth to the twelfth day. It would seem that the larynx, which thus permits liquid aliments to pass, should allow the passage of the air also; but it is not so, for if we remove the canula, the passage will be found insufficient. M. Archambault, who has paid much attention to this complication, believes that it results from the child having, by the use of the canula, lost the habit of moving the muscles which close the larynx in harmony with those which propel the food; and he has found it advantageous to temporarily close the canula with the finger during the attempt at deglutition, the child then being obliged to bring the laryngeal muscles into action, and the harmony thus becomes re-established. This stratagem, however, often fails.

Finally, the removal of the canula or of the tracheotome and the definitive closure of the wound require attention. The canula is rarely removable before the sixth day or later than the tenth; at the end of the first week we should take it out with great care, so as to avoid making the child cry. The infant having become accustomed to breathe by the artificial mode; may be seized with a paroxysm of fear and difficult respiration on the first removal. There may be some obstruction of the larynx, owing to slightly adherent false membranes, mucus, or tumefaction; and the laryngeal muscles may have somewhat lost the power of harmoniously contracting. The difficulty of breathing usually soon disappears if the child can be kept quiet, and, according to the degree in which the laryngeal passage seems re-established, the wound may be strapped with court-plaster, or left for a day longer covered with ointment or lint. If the air does not pass at all, the canula must be replaced until that is accomplished. When respiration is re-established, the opening in the trachea is usually closed in four or five days, and the external wound heals soon after.

V. LARYNGISMUS STRIDULUS.

Spasm of the glottis, laryngismus stridulus, infantile laryngismus, spurious croup, or child-crowing, is a remarkable spasmodic disease occurring in infants during the period of dentition, generally from the fourth to the tenth month; consisting of a temporary partial or complete closure of the rima glottidis, by which the entrance of air into the lungs is impeded or stopped, From the Report of the Registrar-General it appears that in the year 1876, there were in England 647 fatal cases of this disease, of which 436 were males, and 211 females. Of the total number, 620 occurred under two years of age, and all except 10 occurred under the age of five years.

Symptoms.—It is unattended by fever, almost its only symptom being the interruption of the breathing; the general health, however, is always below the proper standard. When the attack begins, if it be a severe one, the child is suddenly seized with dyspnœa, it struggles and kicks, throws back its head, and is unable to draw its breath; while its face and lips get livid, the muscles become slightly convulsed, and death by suffocation appears imminent. At the end of a few seconds, however, the spasm gives way, air is drawn in through the chink of the glottis with a shrill whistling or crowing sound, and the paroxysm is over; sometimes to return very shortly, in a few minutes, hours, or not perhaps for days. The infant shows how much it has been frightened by a loud fit of crying, after which perhaps he falls asleep. One very common and very characteristic symptom of this affection is a spasmodic contraction of the flexors of the toes and fingers, especially of the thumb and big toes, cheirismus and podismus. It is seldom that the disease begins severely. Generally it is preceded by slight attacks which occur mostly at night, but as it continues the attacks become more frequent and more severe. Sometimes death occurs in one of the attacks from long continuance of the spasm, or from general convulsions brought on through cerebral congestion; but as a rule recovery is almost sure to take place, though, as we have seen, a fatal result is by no means impossible. The convalescence, however, is always tardy; and during its progress the patient requires great care to prevent any return of the attacks.

It differs from true croup in the absence of catarrhal symptoms, cough and febrile disturbance, and in the intervals between the attacks being free from all appearance of mischief.

Pathology.—This affection was carefully investigated by Dr. Ley, who attributed it to pressure made by enlarged glands in the neck or chest upon the recurrent nerve, or upon some part of the eighth pair of nerves; subverting the exact antagonism by which the glottis is automatically and involuntarily kept open, and allowing its margins to come together, thus occasioning the dyspnœa and peculiar kind of inspiration so much like that of croup. Enlargement of the thymus gland is among the most constant phenomena observed after death. The other appearances are by no means uniform, and are merely the result of the dyspnœa; perhaps the same may be said of the glandular enlargement. Children of rachitic constitution, and those who are of a nervous and excitable temperament are the chief sufferers from this affection. The liver is generally enlarged from deposition of fat.

The irritation of teething, or intesinal irritation from disordered secretion or improper feeding, are the most fertile exciting causes of the disease. There seems also from the observations of many authorities to be some peculiar atmospheric influence which predisposes to it. Dr. Marshall Hall attributed the disease to some irritation producing reflex spasm—to some excitation of the true spinal or excito-motory system. This irritation *originates*, he says, in—

1. *a.* The *trifacial nerve*, in teething.
   b. The *pneumogastric nerve*, in over or improperly fed infants.
   c. The *spinal nerves*, in constipation, intestinal disorder, or catharsis.

These act through the medium of—

2. The *spinal marrow*, and—
3. *a.* The *inferior* or *recurrent laryngeal*, the constrictor of the larynx.
   b. The *intercostals* and *diaphragmatic*, the motors of respiration.

The *Prognosis* is, as a rule, favourable; for however bad the patient may appear to be he seldom dies in a fit, and if the source of irritation is discovered we can generally effect a cure; especially if, at the same time, the child is placed under the best hygienic conditions, and his strength is carefully maintained. Still, in giving an opinion it may be well to guard ourselves against the possibility of a fatal issue, for it would seem that about one in twelve of those attacked, die. This of course refers to the more severe, and not merely to the milder forms.

Treatment.—During the paroxysm this should be the same as that employed in resuscitating still-born children. The alternate application of hot and cold water; cold affusion to the head and face; slapping the chest and nates; exposure to a current of cold air; and artificial respiration, by the ready method of Marshall Hall, if necessary. Pure and cool air has a wonderfully good effect, and ice to the spine not unfrequently allays the spasm. The vapour of æther or ammonia may also be applied to the nostrils; chloroform has been most successfully used by some physicians; and, as a last resource, if it seems that the spasm will not yield, and that death is imminent, tracheotomy may be performed. When the fit is over careful examination of the gums should be made, and if necessary they may be lanced.

The subsequent remedies must consist of purgatives—particularly aloes, which act specially upon the lower bowel, F. 223, calomel and ipecacuanha, antispasmodics and sedatives—especially hyoscyamus and hydrocyanic acid, F. 57; among antispasmodics the fœtid spirit of ammonia, F. 54, 62, valerian, with æther and lavender, are of great value, the bromide of potassium is also a valuable remedy in this as in almost all spasmodic affections, but especially in those about the larynx. Dr. Marshall Hall recommended the frequent use of enemata. Lastly, tonics will be very necessary, F. 260 *et seq.*, and above all, change of air. The diet should be very simple; a child at the breast should not be fed. If the mother's milk be insufficient, a wet-nurse should be procured; or the child should be nourished by asses' milk, or with a mixture of two parts of pure cow's milk to one of sweetened barley-water. It has been before shown how many of the severe diseases of infants are caused by the folly of some mothers, who are only happy when overloading the stomachs of their children: one of the most alarming affections thus produced is laryngismus stridulus.

VI. HOOPING-COUGH.

Pertussis, or hooping-cough, is especially a disease of early life, though sometimes occurring in adults and even in elderly persons, infectious, often epidemic, rarely occurring more than once in the same individual, and when severe very dangerous. It is attended with a slight fever; and a peculiar hard, convulsive cough, which occurs in paroxysms at uncertain intervals. Its duration varies from two to three weeks or many months.

Symptoms.—This disease usually commences with the symptoms of common catarrh; slight rigors followed by fever, turgescence of the countenance, coryza, restlessness with irritability, and troublesome cough with a feeling of constriction about the chest, and often a good deal of headache. In the course of a few days the slight disturbance of the health ceases; but the cough continues, changes its character, becomes convulsive, peculiarly resonant and prolonged, and is attended with expectoration of frothy ropy mucus. As the severity of the cough increases, the paroxysms assume a suffocative character which terrifies the patient; the vessels of the head, neck, and face become congested and swollen during each attack; the eyes appear as if starting from their sockets; the nose may bleed; and frequently the contents of the bladder and rectum are discharged involuntarily. The paroxysms or fits of coughing recur at intervals varying from twenty minutes to three or four hours, and each is made up of a number of short, forcible, hurried expirations, lasting for from one to five or six minutes. These expiratory efforts are so powerful, and expel the air so largely from the lungs, that the patient seems on the point of being suffocated, until a long-protracted inspiratory act follows, the rush of air through the contracted glottis causing the characteristic crowing or "hooping" noise, from which the disease takes its name: as Dr. Todd remarked, this is the signal of the child's safety.

Much importance is therefore very properly attached to this "hoop," for it is this which gives the peculiar feature to the disease; and not only does it mark its nature, but in itself it affords some useful indications, for those cases are always the most severe in which with much spasmodic cough little or no hooping occurs.

The latter is therefore in great measure a good sign, at all events in severe cases.

The length of time between the commencement of the catarrhal symptoms and the first occurrence of the hoop varies greatly, it may be only two or three days, or it may be as many weeks, and sometimes the disease runs its whole course without any distinct hoop, but with severe paroxysms of spasmodic cough. If we listen to the chest during the fit, literally nothing can be heard for a time until the hoop occurs, when a loud rush will be heard, and after that probably the respiratory sounds will be normal, with perhaps an occasional mucous râle. Directly the fit—which bears some analogy to laryngismus stridulus—is over, the child appears well and returns to his amusements; even if it end in an attack of vomiting—as it frequently does, the patient has a craving for food directly afterwards, and asks for something to eat. The cough is always most severe at night, and the more so the more severe the attack is, not only as regards each paroxysm, but as to their frequency. The first sign of improvement is manifested by a decrease in these nocturnal exacerbations. Then the paroxysms become altogether less severe and less frequent, until at the end of perhaps three weeks in very mild cases, or five or six weeks in the more severe, no symptom remains of the disease. Under the influence of exposure to cold or of improper food, however, the cough may return with all its symptoms; so that for some weeks after apparent recovery great care will be needed.

Very often the excretions are much deranged, the bowels being either relaxed or costive, the motions very offensive, and the tongue foul. The late Sir Duncan Gibb called attention to the fact that the urine is very commonly of high specific gravity, and contains a good deal of sugar.

Dr. West lays it down as a general rule that "those cases in which the catarrhal stage is of long continuance seldom become severe during their subsequent progress," but, on the other hand, he adds, "The preternatural shortness of the catarrhal stage, or its total absence, is not of itself any proof that the disease will be more than usually severe."

Hooping-cough does not always occur in this simple way. Sometimes it supervenes upon other diseases: thus it may come on during convalescence from measles, and not only give rise by itself to dangerous symptoms, but very likely become complicated with bronchitis or pneumonia,—or with some cerebral affection. These *complications* may occur in any case; and, inasmuch as they are very troublesome and not infrequently very dangerous, they demand a brief notice.

1. *Hooping-cough complicated with bronchitis or pneumonia*—occurs most frequently during the cold months of winter and spring, and this complication is answerable for about one half of all the deaths which take place in pertussis. Unless the inflammation is

very severe, it will only be noticed at the commencement that the child is feverish, and that the breathing is accelerated in the intervals between the paroxysms of cough; that the expectoration is opaque and glairy; and that the cough is less constantly followed by vomiting than in simple pertussis. But as the morbid action progresses, the constitutional disturbance becomes great, the respiration difficult and quick, the pulse frequent, the fever burning, and the general signs of bronchitis or of pneumonia fully developed; and, if auscultation be practised, the diagnosis will not be difficult. The symptoms are in fact those of bronchitis, or pneumonia, or both, with the addition of the peculiar cough of pertussis.

We are indebted to Sir James Alderson, and subsequently to Dr. Graily Hewitt, for distinctly pointing out that when hooping-cough proves fatal from pulmonary complication, it generally does so not by giving rise to pneumonia, as has been thought, but by inducing catarrhal inflammation of the bronchial tubes, attended with collapse of a portion of the lungs. This airless state of a part of the lung has also been found in young children from other causes: but as it will be more fully described in the section on bronchitis, we need now say nothing more than that it is identical with that condition which sometimes occurs in new-born children, and which has been described under the name of atelectasis, a condition of the lung which we have already considered.

Dr. Parrish, of Philadelphia, has pointed out that symptoms sometimes occur which closely simulate those due to pneumonia, but which are really only the result of nervous irritability. The breathing is quick, pulse rapid, skin hot and dry, cough short and sharp, but on examination of the chest there are no signs of inflammation existing.

2. *Hooping-cough associated with convulsions, congestion of the brain, or with hydrocephalus*—is not uncommon, especially in infants about the period of dentition. It appears to occasion rather more than half the fatal cases. In these, convulsions in various forms, spasm of the glottis, screaming, &c., are of frequent occurrence, and are indicative of cerebral irritation. When these cerebral symptoms occur early in the attack the case may generally be regarded as of serious import; the cough is usually severely spasmodic, and a fit of convulsions is the speedy result. Congestion of the brain, owing to the return of the blood to this organ being interrupted during the paroxysms of the cough, may be very slight and temporary, or excessive; in the latter case it may lead to inflammation of the membranes, or to the effusion of serum into the ventricles, or even to softening of some of the central parts. Vomiting, severe and protracted, and, at the same time, apparently causeless, is often one of the first indications of cerebral mischief, and should always be regarded with grave suspicion; if, in addition to this, there be much drowsiness, our anxieties will certainly not be diminished. "In cases of pertussis," says Dr. Copeland, in his *Dictionary of Practical Medicine*, Article—*Hooping-cough*, vol. ii. p. 239, "when

chills followed by burning heat of the surface; pains of the head, with obscure redness of the conjunctiva; a fixed, brilliant, dry, and peculiar appearance of the eye; unusual redness or pallor of the face; very torpid bowels with morbid excretions; irritability of stomach independently of the fits of cough; aversion from light or noise; heaviness or drowsiness and languor; grinding of the teeth; or sudden starting or shocks of the body in sleep; rolling or tossing back the head, and piercing screams are observed, then irritation of the brain or its membranes, which will soon pass into organic change and effusion, is manifestly present, whether there be convulsions or not. When stupor or unconsciousness has come on, with one arm waving in the air, or tossed over the head, whilst the other is paralyzed, a farther advanced stage of disease than mere inflammatory irritations or softening or effusion may be inferred."

3. *Hooping-cough may be complicated with disordered conditions of the bowels*—as indicated by a loaded tongue, foul breath, loss of appetite, a tumid abdomen, and offensive unnatural evacuations. If these symptoms continue for some time unrelieved, the chronic irritation of the digestive mucous surface gives rise to a remittent febrile disorder, in which the attacks of cough become more frequent, the breathing gets oppressed and hurried, the child's aspect becomes peculiar, and it is constantly picking its nose and lips. There is also increasing emaciation, and febrile exacerbations and remissions are observed twice in the twenty-four hours. Should the disorder proceed further still, serous effusion into the ventricles of the brain may take place, or disease of the mesenteric glands will be very likely to result.

Dr. Gueneau de Mussy states that the uvula is red and injected, and two bands of rosy-red colour can be seen running along the inner side of the anterior pillars of the fauces until they unite at the base of the uvula. The isthmus and pharynx are similarly injected, and the glands of the latter are prominent, giving to the mucous membrane a granular aspect.

The *Duration* of the disease varies a good deal, but usually it lasts from forty to sixty days, and is apparently influenced a good deal in this respect by the temperament and constitution of the child. In the lymphatic, but still more in the rachitic subject, the affection is usually much more chronic, and very apt to be associated with bronchitis.

Among the more constant *post-mortem* appearances are a congested or inflamed state of the bronchial mucous membrane, with engorgement of the lungs and occasionally emphysema. In the brain are evidences of congestion, sometimes of inflammation, with serous effusion.

Pathology.—When pertussis proves fatal, an examination shows the nature and degree of the complications, and teaches something as to the disease itself. It may be surmised that the affection depends upon some peculiar poison, which, after setting up inflammation of the respiratory mucous membrane, affects and irritates the pneumogastric or vagus nerve. Some writers regard it as essentially a nervous spasmodic affection, involving the pneumogastric nerve chiefly, but also the mucous membrane of the bronchial tubes. Others believe it to be a purely inflammatory disease, affecting the larynx and trachea at first, but extending also to the bronchial tubes. Most likely it is compounded of both these conditions; at all events it is clear that a spasm of the glottis always exists as one of the principal phenomena. Looking to the clinical history merely, it would seem that bronchitis, or at all events catarrhal symptoms, usually precede the more marked spasmodic phenomena; hence probably the laryngeal nerves are irritated in some secondary manner. Dr. de Mussy considers that the congestion of the throat and fauces presents features which characterize the affection as an exanthema of the mucous membrane; and further, that the affection is due to a morbid condition of the bronchial glands. The existence of the enlarged glands can be detected by careful comparative percussion along each side of the upper sternum, with the finger laid parallel to the axis of that bone, and similarly along the spinal groove from the seventh cervical to the fourth or fifth dorsal vertebra. While this examination furnishes a difference in the percussion note, and in the feeling of elasticity and resistance, auscultation reveals more full but rougher breathing than natural on the side of the affected glands. Thus hooping-cough would seem to have its special exanthem, characterized by a special tendency to congestion of the bronchial glands, this latter condition being the immediate cause of the spasmodic phenomena. Dr. de Mussy has been able to demonstrate the correctness of his opinion as to the etiology of the spasmodic cough, by specimens obtained from children who had died of hooping-cough. There was a considerable swelling of the lymphatic glands compressing the pneumogastric and laryngeal nerves. These facts explain why the spasmodic cough only appears towards the second or third week of the attack—after the catarrhal or exanthematous attack, and when the laryngeal and bronchial catarrh has reacted on the glands: why the cough is so obstinate and lasts for months: and why it frequently recurs under the influence of a cold or chill bringing on a fresh outburst of the congestion of the glands.

Diagnosis.—This can only be at all difficult, when—as is sometimes the case—the characteristic hoop is wanting. Even then, the paroxysmal nature of the cough, the expectoration, the intervals of complete relief, and the evidence of a tendency to cerebral congestion during the convulsive attacks will serve to mark the affection.

Prognosis.—Simple hooping-cough is very rarely fatal. A favourable opinion may therefore always be given, unless the cough be very violent, the intervals of relief short and imperfect, the breathing hurried, the rest at night very disturbed, and the appetite bad.

With regard to the different complications it should be remembered, that they often make their approach very insidiously; that they are the more to be feared the younger the child; that they are especially dangerous at the period of dentition; that they are more alarming in such children as have strumous or consumptive parents; that pulmonary complications are very apt to ensue when hooping-cough occurs during convalescence from measles or scarlatina; and lastly—that cerebral symptoms, severe nocturnal exacerbations, fever and dyspnœa during the intervals, and difficult and scanty expectoration after the fits of coughing, are signs of danger. The mortality of hooping-cough is greater in female than in male children; and the colder the season of the year, the greater will be the fatality of the disease.

Treatment.—To describe all the remedies which have been proposed for the cure of this affection would occupy several pages; but as the majority of them are worthless, such a labour is unnecessary. The object of our treatment must be to keep the disease simple, to prevent other affections from complicating it; for since it arises from a specific contagion, like small-pox or scarlatina, so its natural tendency is to run a certain course uncontrolled by art. Emetics we believe are very beneficial in the early or catarrhal stage of the disease, followed by expectorants, such as small doses of the antimonial or ipecacuanha wine, or tincture of squills. Some practitioners recommend astringents, such as alum or sulphate of zinc, and from our experience of them we should say that they are especially useful after a few days' treatment by expectorants, and when the distinctive character of the cough is once fully established. Some authorities give carbonate of potash and cochineal; others have great faith in ferruginous tonics; the late Sir Duncan Gibb asserted that nitric acid—F. 49—is a specific; it has not proved so in our hands; many authorities give mercury in alterative doses; in Germany sulphur has a great repute, it may be given in doses of 3 or 4 grs. three times a day to a child three years of age. Some few physicians think it necessary to bleed. It is, however, impossible not to see, as Dr. Todd has pointed out, that this affection is not inflammatory, but rather spasmodic and convulsive; consequently, all antiphlogistic measures, as such, are to be discarded. The general nutrition of the patient should be maintained by easily digested food. The chest should be well rubbed, back and front, night and morning, with a stimulating embrocation—F. 159. The best drugs are those known as antispasmodics and narcotics; such as henbane, conium, belladonna, lobelia, hydrocyanic acid, assafœtida, camphor, chloric ether, and chloroform. It need hardly be mentioned that the greatest caution will be necessary in the use of some of these remedies, that they should be given in very small doses, and that their effects should be narrowly watched; in the Appendix of Formulæ numerous prescriptions are given, showing the doses, &c., in which they are to be ordered. Of the narcotics' there is none which in our hands has proved so useful as belladonna, and we have generally found that there is a remarkable tolerance of this drug in children. For instance, we have often given, and with good effect, five, six, and even eight minims of the tincture to a child three or four years of age, repeated three times a day; but the effect of such a remedy must be narrowly watched, and it is only when the paroxysms of cough are frequent and severe that any good is likely to result. Hydrocyanic acid we have also found very useful, especially in combination with the dilute nitric acid. Frictions over the chest night and morning, with stimulating and sedative liniments, have proved very useful in our hands; the camphor, soap, and belladonna liniments in equal proportions is the form we generally employ. Where the secretion from the bronchial tubes is excessive it should be checked by astringents; as, for example, by alum, which was very strongly recommended by Dr. Golding Bird as of the greatest value, and has been used with great success by many other physicians; sulphate of zinc, which we have often found very efficacious; small doses of sulphuric acid and infusion of bark; or gallic acid. The ferruginous astringents we have prescribed with admirable results in children of a flabby and enfeebled constitution, in whom there was a tendency to free mucous secretion; where this was thick, ropy, and scanty, an emetic of antimony, or of ipecacuanha, has increased and aided its expulsion. Lately, the bromides of potassium and ammonium have been much vaunted. There is ample testimony in their favour: the proper dose is 1 gr. every six or eight hours for each year of the patient's age; much larger doses have been given without any evil result, but not apparently with any increased beneficial effects. Of the bromide of ammonium we have not had much experience, but we can speak very decidedly of the value of the bromide of potassium. Professor Binz has had good success by exhibiting quinine directly the diagnosis was certain. He says: "It should be given in solution; the dose should not be too small, and should not be administered in a vehicle that would prevent it from coming in contact with the mucous membrane in its passage through the pharynx." We have tried this remedy with good results, prescribing a grain of quinine for every year of life, repeating the dose three times a day and once at night. At the same time, in cases of troublesome nasal catarrh, we place the patient in "hot-packing" at bedtime; after an hour, the wraps are removed, the body well dried, and then compound soap liniment is rubbed into the chest, back and front, and reapplied in the morning. Any thirst is easily relieved by warm milk. Dr. Ortille abridges the affection to three or four weeks by using carbolic acid inhalations and antispasmodics. Professor Steinitz gives hydrobromate of quinine, three to four parts in a thousand parts of syrup; the dose being a teaspoonful every two hours. Lastly, the iodide of silver, in doses of one eighth of a grain, three times a day; and carbolic acid in quarter grain doses with glycerine every two hours, have been highly recommended. In many simple cases, when the paroxysms have been severe, benefit sometimes results from sponging the fauces and glottis, with a strong solution of nitrate of silver—20 gr. of the salt to water 1 oz. When the case becomes chronic, a cure may often be effected by change of air, and especially by removal to the seaside. Tonics will also be necessary at this stage, and of these quinine, with or without steel, will be the most useful.

With regard to the treatment of the various complications, we would only advise that remedies of a depressing nature be neither too readily resorted to, nor too actively employed. In other respects, such a course should be followed as the nature of the complication and the condition of the patient may dictate.

VII. PLEURISY.

Inflammation of the pleura as a primary disease, though comparatively rare during childhood, especially within the first five years of life, is yet probably not so rare as has hitherto been supposed. From the report of the Registrar-General for 1876, it appears that of 232 deaths from pleurisy which occurred in London at all ages, 147 being males and 85 females, 25 only occurred under five years of age, 16 of which were males, and 9 females. In England there were 1,135 of all ages, 657 males and 478 females; of these 81 occurred under five years of age, 47 being males, and 34 females. In both returns the deaths were equally divided among the sexes.

It is, however, very probable that, owing to the difficulties of diagnosis in children, many cases of pleurisy are overlooked in them, for there are few diseases more obscure in their origin, or more liable to be mistaken; this is also partly explained by the fact that the symptoms and physical signs differ somewhat in childhood from those observed in adults. Hence the importance of a careful study of the symptoms of pleurisy in children, and it is deserving of attention, moreover, since it not uncommonly occurs as a secondary affection in the course of pneumonia.

Symptoms.—The chief symptoms, as well as the physical signs of inflammation of the investing serous membrane of the lungs, are in the main the same in the child as in the adult, though, as we shall see, there are some important differences. The disease is usually, but by no means universally, ushered in with rigors followed by fever, and an acute lancinating pain in the side, called a stitch; this pain is aggravated by the expansion of the lung in inspiration, by coughing, by lying on the affected side, and by pressure. In the adult all these symptoms are well marked, not so in the child; sometimes the pain is referred to some other part, or there is only a feeling of general uneasiness, and it is only by closely scrutinizing the respiratory movements that anything wrong is suspected; there is also a short, harsh, dry cough, which is often at first mistaken for what is called a "stomach cough," but it may be distinguished from the latter by the accompanying pain in the chest, and by the greatly increased frequency of breathing, which is partly owing to the instinctive avoidance of pain; the skin is hot and dry, the cheeks flushed, the pulse hard and quick, and the urine is scanty, high-coloured, and of high specific gravity; occasionally there is albumen in it, and rarely some casts. Besides all this, there is one symptom which is not unfrequent in children, but, though it possesses no diagnostic value, is seldom present in adults,—viz., vomiting, the ejected matter being principally bilious. If we listen to the painful part of the chest at this period, we may sometimes be fortunate enough to hear the dry, inflamed surfaces of the pulmonary and costal pleuræ rubbing against each other, and producing a *friction-sound;* and if the hand be placed on the corresponding part of the thorax this rubbing may also occasionally be felt as a kind of fremitus. The friction-sound, however, which is at all times very difficult of detection in children, soon ceases; for either the inflammation terminates in resolution and recovery, or the roughened surfaces become adherent, or they are separated by the effusion of serum, and a kind of dropsy results, known as *hydrothorax.*

If the pleurisy has been severe, the effusion probably becomes excessive—varying from one to many ounces; accumulating in the sac of the pleura, it compresses the yielding lung and suspends its functions, displaces the heart, produces a bulging of the intercostal spaces, and somewhat distends the thoracic parietes on the affected side. When the serous fluid is mixed with pus, the disease is termed *empyema;* and, according to Dr. Hillier, the formation of pus occurs much more frequently and much earlier in children than in adults.

If we listen to the chest when fluid is in it, we shall find the respiratory murmur is enfeebled in proportion to the quantity of fluid present; where this is excessive and the lung is compressed backwards—flattened almost against the spinal column—no vesicular breathing at all will be heard, but we shall hear instead the air passing into the large bronchial tubes, the condensed lung and the layer of fluid acting as conductors of sound; we thus get *bronchial respiration,* and with it *bronchial voice,* or *bronchophony.* Bronchial respiration is one of the earliest physical signs, but it is also one which is most likely to lead to error in diagnosis, as suggesting pulmonary consolidation from pneumonia, &c., and this liability is enhanced by the fact that increased vocal resonance frequently coexists with it, whereas in the adult this sign is usually wanting. The bronchophony may be accompanied by a tremulous noise, resembling the bleating of a goat, which is termed *ægophony;* this sound is usually heard only at the upper edge of the fluid. If the lung be completely compressed, so that no air can enter even the bronchial tubes, then no sounds of any kind will be heard; but on the healthy side the respiration will be more distinct than natural

—will be very loud, or *puerile*. There will also be dulness on percussion all over the affected side, if the pleura be full of fluid; if it be only partially filled, the dulness will be proportionately indistinct: sometimes we can judge of the quantity of fluid present in the chest by placing the patient in different attitudes; for the fluid naturally gravitates to the most dependent part of the chest, and will carry the dull sound with it. This is one of the most valuable signs of the existence of fluid, when once it is clearly made out, but in children this is often a matter of extreme difficulty. Sometimes we can judge of the amount of effusion by the attendant dyspnœa, which will, of course, be more urgent the more the lung is compressed. At this time also the child is frequently unable to lie on the sound side, because the movements of the healthy lung are impeded by the incumbent weight of the dropsical pleura; the pain, moreover, no longer prevents his lying on the diseased side. If we measure the two sides of the chest, the side containing the effusion will often be found larger than the other. We must remember, however, that in many persons the right side of the chest is naturally somewhat larger than the left. On inspection there is seen to be diminished mobility of the affected side.

After a time the symptoms begin to decrease, and absorption of the effused fluid commences. Supposing the lung to be bound down by adhesions, it will not expand in proportion to the absorption of the fluid; the affected side then falls inwards, and instead of being larger than the sound side, will become smaller.

Whenever fever attacks a child, and at whatever age, we should be most careful to ascertain its course by all means in our power. This caution is the more useful now that we are treating of pleurisy. A child has some feverishness and a slight cough, the symptoms are unheeded, and we are much surprised to learn of its sudden death. On examination we find extensive effusion into the pleura, though the symptoms during life were not such as to cause alarm. Such cases of *latent pleurisy* demand great care in diagnosis. The treatment is the same as for the idiopathic variety.

Causes.—The most common causes of pleurisy are exposure to cold and wet, and mechanical injuries. In children it is most frequently produced by the extension of inflammatory action in pneumonia. The jagged ends of a fractured rib will often excite it, and if they wound the pulmonary pleura, air will escape from the lung into the pleural cavity. The escape of air into the pleural sac may also arise from an external wound; or from ulceration extending from a tubercular cavity. When the pleura contains air alone, we say there is *pneumothorax;* when, as generally happens, there is liquid with the air, we call the disease *pneumothorax with effusion.* The physical signs of pneumothorax are, great resonance on percussion, with indistinctness of the respiratory murmur on auscultation; the patient's breathing, cough, and voice, giving rise to a ringing metallic noise, like that produced by blowing obliquely into an empty flask, and is hence called *amphoric resonance*. When there is also liquid with the air, we obtain in addition, on practising succussion, a sound known as *metallic tinkling*, which is said to result from a drop of fluid falling from the upper part of the cavity, and causing a little splash. This, though not infrequent in the pleurisy of adults, is extremely rare in children.

Diagnosis.—The signs of inflammation of the pleura are usually sufficiently characteristic to prevent any error. Sometimes there is a difficulty in diaphragmatic pleurisy, owing to the pain which at the commencement is referred to the abdomen, being increased on pressure, and accompanied with vomiting and purging. The urgent dyspnœa, however, which is generally one of the very early symptoms, the dry cough, the diminution of the vesicular murmur at the base of the lung on the affected side, with attention to the general symptoms, will generally remove the doubt: moreover, the tenderness is not to be compared in severity with that which is produced by peritonitis.

Perhaps the disease for which pleurisy is most liable to be mistaken is pneumonia; in the former, though there is often quite as much general distress as in the latter, there is usually less febrile or inflammatory disturbance. In consolidation of the lung from pneumonia, the breathing is harsher and more tubular, vocal fremitus and vocal resonance are increased; respiration may be half as frequent as the pulse in pneumonia, but seldom more than one-third as frequent in pleurisy. (Hillier.) The line of dulness varies with the position of the child in pleurisy, but is unaffected in pneumonia. The existence of ægophony is pathognomonic of pleurisy. Lastly, the temperature is much increased in pneumonia, but only slightly in pleurisy.

Should the inflammation set in with fever, headache, and vomiting, the disease may be mistaken for some form of cerebral disturbance; but the acceleration of the breathing, the friction-sound heard on auscultation, or—if this be absent, which it very often is in children—the feeble respiratory murmur in the affected part, together with the sudden access of the acute symptoms, will point to the existence of pleurisy.

Prognosis.—In healthy subjects, simple acute pleurisy with effusion is rarely fatal: of seventy-six cases treated at the Children's Hospital at Vienna, only two died.

The combination of pleurisy with pneumonia is, however, very serious; and the same must be said of the results which sometimes ensue from pleurisy, *i.e.*, hydrothorax, empyema, &c. It should be borne in mind, too, that sudden death has occurred several times in cases of pleurisy, and apparently owing to a very rapid accumulation or effusion of serous fluid.

Treatment.—The indications in the treatment of pleurisy are, first, to subdue the inflammation; and second, to promote the removal of its products, by absorption, or otherwise.

In the commencement, therefore, perfect quiet and rest in bed, light diet, and the sedulous application of hot fomentations, mustard poultices, or turpentine stupes over the affected part, must be resorted to, followed by the administration of the hydrargyrum cum cretâ, or of calomel. The object being rather to promote a specific kind of purgation in which the liver shall be freely acted upon, supposing that mercury really possesses this cholagogue action, than for any anticipated benefit accruing from its supposed anti-inflammatory effect upon the system: though if mercury does exercise any such influence, it would probably do so best in cases where serous membranes are involved. If we wish to secure mercurial action, calomel with Dover's powder is the best form, or we may effect it by the inunction of the mercurial ointment. Effervescing saline, with the acetate of ammonia, nitrate of potash, and nitric ether, should now be given, and will be of service in checking plastic exudation. Dr. Hillier has recommended restricting the movements of the inflamed part by applying long strips of diachylon plaster, from the spine to the middle line, over the whole of the affected lung. This plan seems to promise good results. Treatment by the application of the wet sheet locally to the chest is also warmly recommended, especially by some German authorities. In cases where we might otherwise resort to depletion, this remedy may perhaps be beneficial, but it evidently requires very careful management. Depletion by venesection, or by cupping, or by the application of leeches, is strongly recommended by some practitioners. Thus, Dr. West advises that where the symptoms are urgent and the child's previous health has been good, blood should be taken from the arm until syncope is produced; followed in most instances, in three or four hours, by local bleeding. As, however, we have never seen any benefit arise from such practice in the young, but on the contrary, much mischief, we need hardly say that we never follow it. Perhaps in cases of very robust and plethoric children, some moderate depletion in the first onset of the inflammation may be of service, but it certainly ought not to be repeated, nor to be practised at all after the first few days.

If the means which have been recommended prove insufficient to control the disease, and if effusion takes place, attempts must then be made to promote absorption. Two remedies are now very valuable, viz., the iodide of potassium—F. 38—with, if the case be at all chronic, and the patient somewhat depressed, iodide of iron and cod-liver oil: the other remedy being the application of a succession of small blisters.

Dr. Cheadle advocates the limitation of fluid in the food as an aid to the treatment of serous effusions. He finds that children can be restricted to even five ounces of fluid a day without causing distress This method, combined with the administration of digitalis, has proved very successful in his hands in draining away any effusion. He limits the treatment to cases of passive dropsy or inflammatory effusion when the acute stage has passed. Where there is serious renal disease, he advises great caution in adopting this treatment.

When these means fail, when the symptoms are urgent, when the child is becoming weak and exhausted, and affected with hectic fever and night-sweat, tapping the thorax, so as to let the fluid out, has been resorted to; and on some occasions with perfect success.

The opinions entertained by different practitioners as to the value of this operation are very various. Dr. Hughes states that of twenty-five cases in which paracentesis thoracis was once or several times performed, thirteen may be fairly said to have recovered, so far as regards the effusion into the pleural cavity. A German writer, Ziemssen, records thirty-three cases, of which twenty-five recovered and eight died. Henry Bennet, nine cases, of which six were successful; Hillier, twelve cases, of which five died; and West, thirteen cases, of which four only were fatal, the rest either recovering or recovered. These results certainly appear favourable, for of 92 cases, 60 recovered and 32 died.

Should it be determined to resort to paracentesis, before performing the operation, it will be well to make an exploratory puncture with a grooved needle; if fluid issue, a small trocar and canula may then be introduced. The best position for the puncture is probably the intercostal space between the fifth and sixth true ribs, at—or somewhat posterior to—their angles; provided, of course, that the lung is not fixed to this part by adhesions, and that no good reason exists for selecting a different spot. It will probably be better to remove all the fluid; if serum come out, the orifice should be closed and healed; if pus, the aperture should be enlarged and kept open. Some authorities have tried the use of injections—iodine in the proportion of 1 part to 7; and quinine, a grain to the ounce of water. The results do not appear sufficiently encouraging to justify a frequent adoption. Injections ought never to be employed in simple serous effusion, but only in cases of empyema, and especially where there is a fœtid discharge. If they do not suffice to correct the fœtor, it will be well to leave an opening into the pleural cavity, and to inject it now and then with warm water, to which some Condy's Fluid may be added. The use of a drainage tube has been tried and found to answer in some cases, whilst in others it has seemed rather to set up irritation.

In some examples of pneumothorax, where the dyspnœa has been very urgent, it has been found necessary to puncture the pleural cavity with a grooved needle, and to let the air out; such cases, however, are very rare.

VIII. BRONCHITIS.

Inflammation of the mucous membrane of the bronchial tubes is so frequent in early childhood, that it demands very careful consideration. Its importance is enhanced by the fact, first, that the inflammation not infrequently advances along the smaller bronchi to the pulmonary tissue, producing a disease compounded of bronchitis and pneumonia, which has been described as *broncho-pneumonia:* and secondly, the accumulation of mucus in the bronchi, resulting from the inflammatory action, has a great tendency to induce *pulmonary collapse*—the *apneumatosis* of many authors ; a condition identical with the partially unexpanded lung of early infancy—the *atelectasis* of Jörg, the *état fœtal* of Legendre and Bailly.

To show how serious a disease bronchitis is in early life, it will be sufficient to state that of 54,075 who died of bronchitis at all ages in England during the year 1876, no less than 23,871 occurred under the age of 5 years, and of these 14,651 were under 1 year. It appears further by a comparison of these figures with those of former years, that the mortality from this disease is enormously on the increase, not only absolutely but relatively to the increase of population.

Symptoms.—In its simple form, bronchitis usually commences in children with the symptoms of common catarrh, which instead of subsiding, become gradually aggravated, and are attended by slight fever, hurried breathing, quickness of pulse, a tight dry cough, hoarseness, and general febrile disturbance. As the inflammatory action proceeds, the heat of skin increases, the respiration becomes wheezing and more laboured, the cough is severe, sometimes painful, and accompanied by a good deal of mucous rattle, and the countenance assumes an expression of languor, but is at the same time somewhat flushed, the eyes being suffused and often discharging freely. If the child be at the breast, it will often suck eagerly for a few minutes, till the increased difficulty of breathing forces it to desist, when it will throw its head back and have a fit of coughing; the expectoration, if any, is frothy mucus, ropy and tenacious at first, but becoming more free afterwards.

If percussion be practised, healthy resonance will be found; but auscultation will reveal the dry sounds of inflammation—rhonchus and sibilus; while probably the moist sound—large crepitation, will be detected at the posterior and lower part of the chest. Now this condition, which would soon be relieved in the adult, excites alarm and anxiety for the child, owing to the frequency with which it induces *pulmonary collapse:* nothing being needed to excite this state but a copious secretion of viscid mucus, with sufficient debility to prevent its expectoration, and so to allow of its choking up some of the smaller bronchi. Should this occur, we shall find that the difficulty of breathing increases, without any exacerbation of the fever; and that where there was previously resonance on percussion there is now dulness and bronchial respiration. If this condition be mistaken for pneumonia, and venesection, leeches, or antimony be resorted to, the severity of the symptoms will be increased, and possibly a fatal result induced; while, on the contrary, under the influence of stimulants and rubefacient liniments, relief may often be speedily given. Moreover, by the last named remedies the diagnosis will be unmistakeably confirmed; for resonance on percussion will be quickly detected where previously there was dulness, and the respiratory murmur will become audible where perhaps a few minutes before there was no vesicular murmur to be detected.

But bronchitis may tend to an unfavourable termination by other ways than by inducing pulmonary collapse: and more especially by leading to *capillary bronchitis*,—in which the smaller air tubes become intensely inflamed, this inflammation quickly ending in a copious secretion of pus. This severe and often fatal affection may not only result from an extension of the inflammation of the larger air-tubes, but it may also occasionally occur primarily. It is generally accompanied by a good deal of feverishness, hot dry skin, quick pulse, thirst, great acceleration of the breathing, so that the respirations are repeated from thirty to forty times in a minute; distressing and frequent cough; great anxiety of countenance with frequent flushings; heaviness of the eyes with injection of the conjunctiva; extreme restlessness; and great frequency with weakness of pulse. As death approaches, the face assumes a livid hue, the cough becomes smothered, the respiration more laboured, often as frequent as eighty in the minute, the alæ nasi are widely dilated, and there is great drowsiness: then for a few hours the sufferings appear lessened, unless under the influence of a paroxysm of dyspnœa, and the child quietly dies. In some severe cases this event takes place in the course of a few hours, or it may run on for a week or two.

The *Diagnosis* of capillary bronchitis is often very difficult, since the symptoms bear a striking resemblance to those of pneumonia, and are not altogether dissimilar from those of croup, although there are important points of distinction. Moreover, it is sometimes by no means easy to practise either percussion or auscultation on the alarmed and restless child. If we succeed in doing so, however, we shall observe a natural degree of resonance on percussion; while auscultation will detect—perhaps with rhonchus and sibilus—a subcrepitant râle, a moist sound which is larger than the small crepitation of pneumonia, and yet smaller than the large crepitation of simple bronchitis. Moreover, this râle is most frequently to be found at the posterior part and base of both lungs: and as the disease advances it often becomes replaced by large crepitation.

Between croup and capillary bronchitis, Valleix has drawn the following distinctions:—

CROUP.	CAPILLARY BRONCHITIS.
Dyspnœa, paroxysmal inspiration, whistling with laboured respiration.	Dyspnœa continuous and severe. Inspiration stertorous; respiration short, rapid, and panting.
Voice very indistinct.	Voice unaltered.
Expectoration of false membrane shreddy, but occasionally in the form of a large tube.	Expectoration of false membrane rare in any form, but occasionally in small arborescent portions. When this occurs it is conclusive.
Auscultation reveals a feeble respiratory murmur, with whistling or hissing noises.	Auscultation reveals moist crepitant râles over the greater part of the chest.

Prognosis.—Simple bronchitis is dangerous, as before mentioned, owing to the risk of its inducing collapse of the lung: and as the liability to this is great in children at the breast and in those under five years of age, the prognosis ought to be very guarded. Capillary bronchitis is indeed a most serious affection; and if not directly fatal, is likely ultimately to prove so by the supervention of pneumonia.

At the same time, it is not every case of bronchitis which is fatal or even dangerous, for very much depends upon the child's constitution, and upon the treatment adopted, as also upon the original severity of the attack; some cases readily yield to suitable treatment and soon recover, but all require the most careful management.

Secondary bronchitis in enfeebled children, following measles, hooping-cough, &c., is generally very severe; for resolution of the inflammation is very difficult to bring about, and it is likely to run on to pneumonia.

Capillary bronchitis is a much more severe and dangerous disease, for it implies not only that the smaller tubes are involved, but that the entire bronchial track is inflamed, and acutely so, often indeed to such an extent as to lead to the formation of plastic exudations.

Morbid Anatomy.—The mucous membrane of the bronchi is generally found more red than natural in children who have died from bronchitis; the redness varying in degree and extent according to the violence of the morbid action, being usually most marked in the secondary tubes, and sometimes extending into the smallest branches, or even into the pulmonary cells. According to Rilliet and Barthez, bronchitis such as we have described almost always ends in at least partial pneumonia, which is discoverable after death.

There may be also some thickening and softening of the membrane; and it is often covered with a thick, opaque, tenacious, muco-purulent secretion. The tubes themselves are often greatly dilated; so that either the secondary tubes assume the size of the primary branches, or portions of them become expanded into the form of cavities; these little dilated cavities are formed by the imprisonment of air in the pulmonary cells through the blocking up of the air-tubes; with each inspiration this increases until the pressure of the contained air causes the smaller tubes to dilate. When these dilatations exist, as they often do, upon the surface of the lung, they give to it more or less of an emphysematous appearance. There is commonly also some congestion of the lungs.

When the inflammation has extended from the air-tubes to the surrounding pulmonary tissue, we then find indications of what may be really termed *lobular pneumonia.* Irregular patches of the lung, varying in size from a pea to a nut, are found of a vivid red colour, hard and solid,—or perhaps grey and infiltrated with pus: and if there are many of these patches they may coalesce, and that which was lobular becomes general or lobar pneumonia.

Occasionally a very peculiar appearance is met with and has been described under the names of *vesicular bronchitis* or *vesicular pneumonia.* The portion of lung affected is dark-coloured and solid; and covered with a number of small, round, yellow spots, each containing a drop of pus. At first sight the appearance is very much like that presented by miliary tubercle, but this is soon dispelled when the points in question are punctured. Sometimes, where a number of vesicles are involved and in close contiguity, the result is a small pneumonic patch, having all the appearance and character of ordinary though circumscribed pneumonia.

Perhaps the most common result of bronchitis in childhood is not partial or general pneumonia, but a very different condition—though for many years mistaken for inflammation and described as lobular pneumonia because it attacked isolated lobules—namely, collapse of the air-cells of the lungs; a condition very properly called *pulmonary collapse,* but which may be designated as apneumatosis if a hard name be desired. This occlusion or collapse of the air-cells is no doubt caused by the thick bronchial secretion presenting an obstacle, sometimes at one point, sometimes at another, to the admission of air. The child inspires feebly, and the secretion which it can neither expectorate nor expel by coughing, closes the entrance to some small bronchial tube like a valve, each succeeding expiration forcing out a little of the air retained behind the obstacle, until—as no air is inspired—the vesicles collapse. It is readily recognized after death by the affected parts being found violet-coloured, solid, and heavy—so that they sink in water if detached from the healthy tissue: they are also less voluminous than natural, and covered by healthy pleura. On practising inflation, the collapsed portions—no matter how numerous or extensive—are quickly restored to their normal condition. Those parts most distant from the roots of the lung are chiefly affected, especially the margins of the lobes.

It is this liability to pulmonary collapse that makes infantile bronchitis such a dangerous disease; it is also often the cause of death in hooping-cough; and doubtless it has proved so in many cases of fever where the fatal result has been erroneously attributed to pneumonia.

Treatment.—This must be subordinate to the degree of inflammation present, the extent of the febrile re-action, and the strength and constitution of the child; regard being also paid to the fact of the disease being either primary, or secondary to some other affection, such as measles, pertussis, &c.

Simple bronchitis often ceases in a few days without medicine, but the child ought to be watched, to guard against the occurrence of collapse of the lung; he should also be kept indoors in a warm comfortable atmosphere, and be allowed a simple milk diet, and to drink freely of some demulcent fluid. If there be much heat of skin, or if the morbid action appears to be progressing, a saline mixture—F. 246, 250—is to be prescribed.

In more severe cases, attended with high fever, it is wise to commence the treatment with an emetic, and in selecting a drug for this purpose we should be careful to choose one which will accomplish the object with as little depression as possible; ipecacuanha is on this account decidedly preferable to antimony; carbonate of ammonia, mustard, or senega will also act beneficially. After this a warm bath, followed by warm drinks to promote diaphoresis, will do great good. As in other inflammatory disorders so in this, many physicians resort to bloodletting: but most practitioners agree that more than ordinary caution is required in its use; and it will readily be imagined—after our remarks upon the mischief of bleeding in croup, pleurisy, &c.—that we do not advocate the taking of blood in infantile bronchitis. Remembering how readily pulmonary collapse takes place in a weak child from mere inability to expel the viscid phlegm, we can hardly imagine any instance in which this practice is justifiable. When it is desirable to employ depressing measures, antimony will, no doubt, accomplish all that can be desired; but while using this agent constant watching and care will be needed to prevent its depressing effects being carried too far.

In those forms of bronchitis which occur secondarily, antimony will seldom be tolerated at all; in such cases senega and squills—with or without ammonia—or a mixture containing ammonia and assafœtida—F. 60, 61—will be found very valuable. The remedy which we have found of the greatest value is the carbonate of ammonia; it promotes free secretion, which always affords relief, and combined with chloric ether and the oxymel scillæ, it produces the best results. Should pulmonary collapse take place, all antiphlogistic measures must be discarded, and stimulating emetics, warm baths, rubefacient liniment, and strong beef-tea with wine, should form the remedies on which most reliance should be placed. Whether benefit would be gained by allowing the child to breathe an atmosphere containing more oxygen than natural is doubtful; but in a severe case the experiment may fairly be tried.

Whenever there is much depression, the combination of benzoin and camphor, as practised by the Germans, is of great use. Stimulating drinks should also be given pretty freely, and we have seen the best effects from hot whisky and water sweetened with liquorice, and given to the extent of two ounces of the spirit in twenty-four hours, in severe cases in children two years of age.

After the acute symptoms have subsided, resort may be had to a nourishing diet, stimulants, and tonics; and in such cases great benefit is obtained from some preparation of bark, as F. 274. Morphia is an agent which is often very beneficial, when the cough is troublesome and the secretion of mucus scanty; where there is free secretion it is rather apt to hinder its expulsion, and so to promote a feeling of suffocation. It may be given to the youngest child—but only with the greatest caution—in doses varying from a quarter or half to one drop of the Pharmacopœial solution repeated night and morning.

Stimulating liniments, sinapisms, and such like to the back and front of the thorax, often do great good: blisters are seldom of any benefit, and are sometimes very mischievous. When there are attacks of dyspnœa, a sinapism to the chest with a warm bath, will sometimes give relief more quickly than any other proceeding; when, on the contrary, the difficult breathing is due to the air-tubes being overloaded with a viscid secretion, a stimulating emetic will be required.

IX. PNEUMONIA.

Though inflammation of the substance of the lungs is not a very common disease in infants and young children, it is certainly a very fatal one, for of the 24,492 deaths at all ages from this disease in England during the year 1876, no less than 12,878 occurred under five years of age. There is a much higher mortality among males than females, and more proportionately during the first twelve months than subsequently; thus:—

Mortality from Pneumonia in England in 1876.

	Males.	Females.	Total.
Under one year. . . .	3,779	2,794	6,573
One year	1,925	1,777	3,702
Total	5,704	4,571	10,275

In London alone 2,340 deaths under five years occurred in the same year from this disease, as against 4,192 of all ages. And here again the same fact is observable; thus:—

MORTALITY FROM PNEUMONIA IN LONDON IN 1876.

	Males.	Females.	Total.
Under one year. . . .	641	482	1,123
One year	361	321	682
Total	1,002	803	1,805

On comparing these figures with those of former years it appears that the proportionate mortality from this disease remains relatively about the same.

The disease is most prevalent in November, December, April, and May, the maximum number of cases occurring in May. The predisposing causes are dentition, constitution, improper feeding, previous illnesses, and parentage. It is much more frequent among the children of the poor than those of the rich.

Pneumonia may occur primarily or secondarily—as has been already shown—from the extension of bronchitis. Pneumonia in the child is in many respects a very different matter from what it is in the adult, or, perhaps it would be more correct to say that the varieties or variations of pneumonia in children are greater than in adults. Whilst pneumonia of the right lung is more common than that of the left, as in the adult, double pneumonia is not infrequent. This may be due to the fact that the three stages of the affection may co-exist in the child. We shall first describe the symptoms and course of an ordinary case of lobar pneumonia, and then detail some of the varieties to which inflammation of the lung tissue itself is subject.

Symptoms.—In idiopathic pneumonia—*i.e.*, where the pulmonary substance has not become involved by the extension of bronchitis, but has been affected from the commencement—the symptoms sometimes commence suddenly, and very commonly in the night, with rigors followed by cough, hurried breathing, burning heat of skin, quick pulse, thirst, and great febrile disturbance; sometimes the attack is ushered in by a fit of convulsions, but in the greater number of cases the disease comes on more gradually, and it is merely observed that the child is out of health, that it is fretful, restless, feverish—especially at night, thirsty, and apparently affected with headache. Very shortly afterwards, cough comes on, and perhaps vomiting: the bowels are constipated, the urine is thick, high coloured, and generally, as in the case of adults, is throughout the attack deficient in chlorides; the tongue is coated with a white fur, there is loss of appetite, and an attentive observer will notice that the respiration is hurried. This latter circumstance will be detected by noticing that the child does not seem able to breathe quietly through the nares, but keeps its mouth open; and when it sucks it only does so for a few moments at a time, eagerly seizing the nipple, and then suddenly letting it go in order to take a deep inspiration.

The *first stage* of pneumonia—or that of engorgement, thus passes into the *second*—or that of hepatization. The patient is drowsy, the cough is short, painful, and frequent, the skin is harsh and dry, the body is very hot, the temperature often reaching as high as 104°, while the extremities, perhaps, are cold, the countenance is heavy and anxious, the face pale, with a livid hue round the mouth, the pulse is very quick and hard at first, the alæ nasi are dilated with each inspiration, and the respiration is laboured and hurried—or even panting; its increased frequency is out of all proportion to that of the pulse, for, though the latter is quick, the former will often number nearly the half of the pulse beat, instead of being less than the quarter. Herpes labialis very commonly appears in the course of a few days, vomiting often occurs, and occasionally diarrhœa; there is great thirst and little or no appetite. As children—even up to the age of six or seven—invariably swallow the sputa, we are deprived of that valuable information which is afforded by the changes in the appearance of the expectoration in the grown person.

Percussion of the chest in infantile pneumonia does not generally afford such well marked signs as in the case of the adult. There is, however, manifest dulness on the affected side in the majority of cases, and especially in the infra-scapular region. It is well known that the sounds obtained by percussion in the healthy child vary with the intensity of each respiratory movement; and also that the thorax of children under two years of age frequently resounds less perfectly than that of adults.

The results of auscultation are more certain. The minute crepitation which is so readily detected in the pneumonia of the adult is but rarely found, though under the influence of a deep inspiration it may perhaps be heard for a moment; but the sub-crepitant râle—which has been previously described—can invariably be discovered, and very often in both lungs, at their bases and posteriorly. When the disease has advanced to the second stage, this râle becomes weaker, and is partly or completely obscured by being mixed up with bronchial breathing: it may generally be detected however on deep inspiration. The bronchial breathing is but heard at the centre of the region of dulness: in hydrothorax, it is most marked above this region. It must not be thought that bronchial breathing in the child is always the same rough, strong, whistling bruit heard in the adult: on the contrary it is feeble and indistinct, and more like a rough respiration. Should only one lung be attacked, the diagnosis will probably be aided by the loud puerile breathing which will be heard on the sound side.

If the inflammation now progresses towards resolution, the bronchial respiration disappears, the sub-crepitant râle returns, and is gradually superseded by the normal vesicular murmur. The general symptoms also improve *pari passu*, and in a few weeks the patient is restored to health.

Unfortunately, instead of resolution taking place, the child often dies towards the end of the second stage, when an extensive portion of lung has been affected; if it survives, and the treatment fails to check the inflammation, then the disease passes into the *third stage*—or that of purulent infiltration. The respiration is now more laboured, the voice lost, the face sunken and pallid, the extremities cold though the trunk remains hot, the pulse so frequent and small that it can hardly be counted; there are cold clammy sweats about the head, and life either becomes gradually extinct, or death occurs in a fit of convulsions. By auscultation bronchial breathing is found to have quite supplanted the sub-crepitant râle; while if the child lives until the lung has completely passed into the state of suppuration, large gurgling crepitation may be heard.

There is no symptom which affords such valuable indications in regard to *Prognosis* as the temperature; at the onset of the disease it is very high, and in severe cases it will frequently run up to 105°. This, however, may always be regarded as a danger point, and on the other hand a diminution of temperature, especially if it occur at about the fifth or seventh day is always a favourable sign.

Very commonly crises occur in the course of this disease. The little patient will one night appear to be much worse, but sleep comes to him, and in the morning it is found that the inflammatory symptoms have subsided, the temperature has rapidly diminished, and this is a very good sign; the child is greatly relieved, he breathes easier, is more cheerful, takes nourishment better, and in the course of perhaps a week or so, he appears convalescent. But sometimes the improvement, if it occur at all, is only temporary; febrile reaction sets in with greater vigour, there is more severe prostration with increased temperature, and death from exhaustion supervenes. These crises occur at about the seventh, ninth, or eleventh day, and according to Ziemssen they are much more common on the uneven than on the even days

Diagnosis.—There can be no difficulty in diagnosing pneumonia from bronchitis: the greater severity of the symptoms, the intense heat of the trunk, persisting through the whole course of the disease, the quick and feeble pulse, the panting respiration with the continual movement of the nostrils, the sub-crepitant râle, and the absence of rhonchus and sibilus, all indicate that the substance of the lungs is inflamed.

In most cases of pneumonia, whether in the child or in the adult, a certain amount of pleurisy exists with the pneumonia; though it may be very slight. Sometimes, however, an attack of pleurisy is mistaken for pneumonia: but this error will be avoided by remembering that in pleurisy the pain is more marked and severe than in pneumonia, that at the onset a friction-sound can generally be detected while there is no sub-crepitant râle, that percussion over the inflamed pleura produces pain, and that at the commencement of the inflammation there is greater restlessness, and perhaps disturbance of the brain, than occurs in the early stage of pneumonia.

In some cases the cerebral symptoms are so prominent that the idea of meningitis is suggested, and a mistake in diagnosis is very apt to occur. There may be either convulsions followed by a kind of comatose condition, or severe pain in the head with vomiting and delirium. The very high temperature from the onset, and its steady continuance; the great and constant acceleration of breathing; the short duration of the attack of vomiting; the absence of nausea and irritability of the stomach; the healthy evacuations; the quick regular pulse; and the urgent thirst are symptoms which should readily enable us to diagnose pneumonia from a cerebral affection. But the possibility of such a mistake requires a careful examination of the chest in all such cases. Dr. Hillier thought that these head symptoms were more apt to occur in inflammation of the upper than of the lower lobes.

From pulmonary collapse it differs in the amount of febrile disturbance, in the increased temperature, and the flushed face, all which are heightened in pneumonia; but diminished in collapse of the lung.

We may have all the symptoms of enteritis due to the sympathetic disturbance of the stomach and bowels. And here we would say that pain, referred to the abdomen by children, is generally due, in pulmonary affections, to some impediment to the descent of the diaphragm. Auscultation will be one of the best aids in differentiating between the gastric and lung affection.

Terminations.—Pneumonia is a most severe disease, and often ends fatally in spite of all our care. In infants both lungs are usually attacked. Mention has already been made of the termination of the inflammation by resolution, and the gradual restoration of health. If the morbid action proceed to the third stage, diffused suppuration of the lung is a frequent consequence. In such cases there is not uncommonly an apparent temporary improvement before death; for the alarming symptoms diminish, the dyspnœa decreases, and the cough returns. But if we look carefully into the case, we shall find that the body still remains very hot to the touch, and the temperature is very high; there are nocturnal exacerbations of the fever, the child rapidly wastes, and death occurs from exhaustion in the course of two or three weeks.

Occasionally, in depressed constitutions, acute pulmonary inflammation terminates in *gangrene* of the lung. This is recognized by the occurrence of an intolerably fœtid state of the breath, resembling the odour which proceeds from gangrene in other parts, and by the expectoration of gangrenous matters with fragments of lung tissue.

Varieties of Pneumonia.—We stated at the beginning of the chapter that there are certain varieties of pulmonary inflammation common to children, though not, perhaps, altogether peculiar to them. That which we have already described—viz., lobar pneumonia, is certainly not so common nor so fatal in early life as the *lobular* variety. This, which Trousseau termed peripneumonic catarrh, and which others have designated broncho-pneumonia, is, as its last name implies, a compound disease in which bronchitis is a most important element, and this all the more so because the bronchitis is of the capillary variety, a disease which is often in itself a severe and fatal one.

Reisland has described some cases of so-called *Cerebral Pneumonia* in which there was delirium and high temperature (104·3° to 105·3° Fahr.). They were treated successfully by wrapping the patients in cloths wrung out of ice-cold water.

Broncho-pneumonia most frequently occurs in young children under five years of age, and is a not common sequela to measles and hooping-cough. Sometimes the pneumonic element is but an extension of bronchitis. In its anatomico-pathological characters it differs somewhat from the lobar variety; not merely in the fact that the inflamed portions are of more limited extent and that they occur in patches in different parts of the lung which may or may not become agglomerated, but the results of the inflammatory processes are different; there is very seldom any fibrinous exudation, but a kind of serous, or sanious, and sometimes semi-purulent fluid is exuded from the inflamed patches on pressure. Besides this, the bronchial tubes leading to these patches are actively congested or inflamed, filled with viscid tenacious mucus, and very frequently dilated by the pressure of the air imprisoned within the air-cells, as has been already described.

The *Symptoms* of this variety of pneumonia resemble very much in the main those of the lobar variety. The earlier symptoms vary according as the disease results from measles, hooping-cough, or bronchitis. But when the pneumonia has fairly set in there are the same general symptoms as characterize pulmonary inflammation—viz., acute febrile disturbance, rapid pulse, and, comparatively speaking, still more rapid respiration, high temperature, cough, and sometimes, if the child be not very young, expectoration of viscid mucus.

As distinguished from lobar pneumonia we have more marked crepitant bronchitic râles, a more generally diffused or patchy inflammation, as revealed to the stethoscope, and the absence of that marked characteristic of the lobar variety. There is also generally a wide difference in the history and progress of the disease, the latter beginning suddenly with no previous ailment, the former commonly commencing with bronchitis. The temperature, too, which affords such valuable indications, is seldom so high in this as in the lobar inflammation; and lastly a chronic condition is much more likely to result from the former than from the latter disease.

In regard to *Prognosis* it need only be said that of the two varieties the lobular is, as a rule, the more fatal, partly because of the accompanying bronchitis, and partly because the inflammation is generally of greater extent, and frequently involves both lungs at the same time.

Treatment.—Blood-letting, tartar emetic, and mercury, were formerly the agents on which we were taught mainly to rely in all cases and varieties of pneumonia. We need hardly repeat our conviction that bleeding neither can nor will do any good, but rather harm. The influence of old established rules is, however, so great, it is so difficult to contend against authority, so many plausible arguments may be put forward to the disadvantage of novel truths, and it is so certain from the occurrences of every-day life that there are still some people, who—like the old writer—prefer going wrong with Plato to going right with less gifted men, that it may be necessary again to protest against depriving the young of their blood by the lancet, by the barbarous cupping-glasses, or by leeches, simply because there is inflammation present in an important tissue. On the Continent, the practice of treating infantile pneumonia by bleeding is much more rare in the present day than it was ten or twelve years ago: and many of the best foreign physicians assert that this practice will not only invariably and permanently debilitate the system, but that not infrequently it is almost the direct cause of death. One of our highest and best known authorities on children's diseases, Dr. West, in the last edition of his celebrated work, has almost renounced the treatment by depletion which formerly he so stoutly advocated; now he appears to limit its use only to those cases which, coming on suddenly, cause great distress, and in which the child is of a specially robust and plethoric constitution. It may now and then happen, perhaps, in rural districts, that such practice appears called for in the cases described, but in the upper classes of society and in the children generally who live in our large towns, we feel strongly that the remedy in question is nearly as bad as the disease, and will certainly tend to make the latter worse.

In the same way, and for the same reason that it directly depresses nerve-power, we object to the administration of antimony, except it be in very minute doses, and merely for the purpose of favouring resolution by promoting some slight expectoration; even then its use should be limited to cases of full plethoric habit with a bounding hard pulse, a high temperature, and dry skin.

To mercury as an anti-inflammatory remedy, we have an equal or even greater objection; for we do not believe that anything can be urged in its favour, and its use should in our opinion be entirely restricted to its aperient or alterative action.

Mild purgatives or alteratives to maintain a gentle action of the bowels; occasionally emetics to expel any viscid phlegm, if there be difficulty in expectorating it; the administration of some saline such as the liquor ammoniæ acetatis to act upon the skin, with some diffusible stimulant; and a light diet, with a free supply of cold water—these are the principal means on which we must rely. Counter-irritation to the chest by mustard-poultice or turpentine stupe will often relieve pain and do good otherwise, but blisters should never be used, as they are by no means free from danger in young children, and they always occasion a good deal of distress. Sometimes warm baths, frequently repeated, give ease and temporarily alleviate all the symptoms of pain and uneasiness: if there be much restlessness, small doses of opium do great good, or even the gentle inhalation of chloroform will be beneficial; if there be much prostration, wine and strong beef-tea will be required.

As soon as the disease passes on to the third stage, or that of suppuration, the discontinuance of all lowering measures is indispensably necessary, and wine or brandy with strong beef-tea, and a highly nourishing diet, are the remedies to be adopted. The bowels may be made to act occasionally by a purgative dose of calomel; but it must be borne in mind that if diarrhœa be induced, harm will certainly result. Tommasi recommends the exhibition of a solution of carbolic acid (one part in forty of water, sweetened), when the fever is high and the expectoration consists of sanguineous fœtid pus. He gives from ten to twenty minims of the solution thrice daily. Jürgensen considers pneumonia to be akin to acute rheumatism and cerebro-spinal meningitis, and as being produced by some external cause of infection similar to that of malaria. He gives quinine freely, and employs cold baths whenever the temperature reaches 104° Fahr., and allows a liberal diet, including meat. His treatment is based on the conclusion that as the disease cannot be cut short, life is to be preserved until nature can effect a cure. Directly convalescence sets in, bark should be given, and this may be advantageously followed at the end of a week or two by some ferruginous tonic, and the most nourishing kinds of food.

X. INFLUENZA.

We have now to speak of a disorder that occurs as an epidemic, attacking large numbers of persons, and either progressing in a definite direction, or confining itself to a certain area. Influenza appears to have been first recognized in the year 1732, when it attacked half the population of Europe. The invasion of epidemics is referred to atmospheric or telluric influences, but the causation is a matter of uncertainty. Influenza is said to be due to a specific poison, and is regarded by some as a virus and infectious, and by others as malarial and non-infectious. It generally attacks the inhabitants of large towns, more especially those living under bad hygienic conditions, as in low, damp, and over-crowded neighbourhoods. Youth and old age, exposure to cold, and debilitated health, favour its introduction. Whilst an attack does not give perfect immunity in the future, it tends to influence the nature of other disorders. An epidemic of influenza often precedes the onset of measles or hooping-cough.

Symptoms.—There may be a period of incubation varying from two to three weeks. The onset of the disease may be sudden or gradual, and is marked by chilliness, general malaise, pains in the limbs, more or less headache, nausea or vomiting, high fever with a hot and dry skin, or sometimes sour perspiration, and *very marked general prostration and debility*, out of all proportion to the general symptoms. The pulse is at first full and bounding, but afterwards becomes soft, weak, and slow. The urine is scanty and loaded with lithates. The temperature is generally higher towards night. At first there is heat and dryness about the nose and smarting of the eyelids, these give place to a watery, acrid discharge, followed by sneezing, impairment in the sense of smell, and occasionally by epistaxis. The congestion of the mucous membrane leads to severe pain over the frontal sinuses. The throat feels sore, taste is defective, and there is generally some deafness from the Eustachian tubes being involved. The air passages may be invaded: this is indicated by a dry paroxysmal cough, hoarseness, tickling in the throat, dyspnœa, and subsequently expectoration of bronchitic sputa. There is much thirst, a furred tongue, inappetency, and constipation or diarrhœa.

Morbid Anatomy.—There is more or less congestion of the whole of the pulmonary tract. At times the alimentary canal and genito-urinary tract are also involved. If complications, as pneumonia, pleurisy, or pericarditis occur, their characteristic lesions will be present. The spleen is not enlarged.

Duration.—The affection generally passes off in from four to ten days, there being a critical perspiration and abundant acrid, or profuse, diarrhœa. If complications set in, convalescence is more or less tedious.

Sequelæ.—We must be prepared for capillary bronchitis, pneumonia, adynamia, nervous symptoms, as convulsions and stupor, and inflammation of serous membranes.

Prognosis.—As a rule, most uncomplicated cases terminate in recovery. Our opinion, however, must be guided in other cases by the nature of the inter-current affection, the age of the patient, and the state of the general constitution.

Treatment.—In every case, the patient must be kept in a room in which a uniformly warm temperature can be maintained. If there be constipation, a gentle purgative should be administered. The catarrhal symptoms may be mitigated by inhalations of steam, to which chloroform, ether, or some opiate may be added. Warm fomentations, poultices, or sinapisms are often useful where there is any dyspnœa. Any accumulation of secretion in the bronchial tubes must be removed by small doses of ipecacuanha. Should capillary bronchitis or pneumonia intervene, we must stimulate with ammonia, ether, senega, or camphor. Any troublesome cough should be allayed by opiates. Iodide of potassium, opium, or morphia are useful, if the pains in the limbs are severe. The thirst may be relieved by a diluted solution of nitrate of potash, lemon-juice, and sugar; and the pyrexia, by tepid sponging. If the cerebral symptoms be severe, free dry cupping or leeching may be employed. In uncomplicated cases, the diet should consist of milk and beef-tea. Where there is any tendency to adynamia, alcoholic stimulants must be resorted to early, and the system maintained by abundant liquid nourishment. During convalescence, the body should be clothed with flannel, the diet should be liberal and stimulating, and quinine and iron be exhibited for some time. A change of air often expedites recovery.

XI. PHTHISIS.

Phthisis, or pulmonary consumption, in children presents certain special characters which distinguish it from the same disease as it occurs in after-life, though unhappily, as regards the prominent features and the general result, there is a striking resemblance. In the remarks upon tuberculosis — Chapter II., section ii. — the most important of the pathological peculiarities of this disease are pointed out; we shall therefore now only speak of the symptoms, causes, treatment, &c.

Symptoms.—The points of difference between pulmonary phthisis in the child and that in the adult are the more strongly marked the younger the patient; and, perhaps, at about fifteen years of age the distinction may be said to cease. The disease comes on very gradually; the child is observed to be out of health, it is listless, droops, has no appetite, loses flesh and strength, and, perhaps, complains of slight pains about the chest. But preceding all special local pulmonary symptoms there are the general symptoms of tuberculosis, those distinguishing peculiarities which mark the tubercular diathesis. Children thus affected have a highly nervous temperament, the skin is thin and delicate, the hair fine and silky, the bones long, thin, and straight, the joints small, ossification is rapid, the teeth are therefore cut early and the fontanelles close quickly, the face is oval, or, more correctly speaking, conical, the forehead forming the base, the chin the apex of the cone; the eyes are bright, large and full, the pupils dilated, and the whole aspect of the child is one of delicacy and refinement. After a time a slight dry cough comes on; but this is never severe like the cough of the adult, nor is it attended by expectoration—for the child swallows what the older person spits up. In children, too, there is an absence of hæmoptysis, diarrhœa is not very common until the later stage of the disease, but is then very frequent, and often there are no colliquative sweats.

As the disease progresses, the listlessness and general weakness increase, the skin becomes hot and dry—especially at night, and the temperature maintains a steady rise; this, as has been pointed out by Dr. Sidney Ringer, is a very valuable sign of tubercular disease: other diseases will frequently occasion a temporary increase in temperature, but when for weeks together there is a persistently high temperature, say of 103° and upwards, night after night, without any apparent cause, the existence of tubercular deposition may be pretty surely diagnosed : and in the case of pulmonary phthisis, the respiration becomes quicker, sometimes as much as thirty or forty in the minute, and is after a time attended with wheezing; the child wastes rapidly; the skin becomes wrinkled and sallow; the face assumes an appearance of premature old age; the strength decays ; aphthæ form about the mouth ; and the child dies, either from exhaustion, the body being reduced almost to a skeleton, or from some intercurrent attack of bronchitis or pneumonia.

The physical signs derived from percussion and auscultation cannot be as much relied on in the child as in the adult; since the deposit of tubercle in children is much more diffused, and we moreover lose that information which the phenomena of the voice afford in adults. In estimating these signs it is important to remember how they are produced, and upon what they depend. Speaking generally, we may say that the physical signs of pulmonary phthisis are caused, first, by the deposition of tubercular matter in the lung tissue, and secondly, by its being broken up and disintegrated.

As regards the percussion sounds, these are but slightly altered in most cases, owing to the fact that, at least in very young children, the tubercular matter is widely diffused throughout the lung and is not deposited, as in the case of the adult, in one part more than another. When, on the contrary, it is so deposited, the apices of the lungs are the parts generally selected, and dulness on percussion becomes a marked feature. In that case there is occasionally some flattening of the chest wall over the deposit, with diminished respiratory movements; there is also increased vocal fremitus, and vocal resonance.

It is necessary to remark here, that, in examining a child's chest, we must be careful to place it fair for both sides, that one side should be compared with the same spot on the other side, and that the conditions of both should be similar; in other words, that the examination of the two sides be made either during inspiration or expiration.

In auscultating over the diseased parts, the sounds will be at first feeble, then gradually harsh or bronchial, as the deposition increases: and subsequently, when the tubercular matter begins to break up and disintegrate, moist sounds will be heard, at first as small crepitation, gradually getting coarser, until, if a cavity be formed, we get gurgling with cavernous breathing.

In the adult, bronchial or harsh breathing and prolonged respiration are very suspicious signs, when they are heard in the infraclavicular regions; in the child they are very untrustworthy signs in this region, but are of greater value elsewhere, except in the centre of the chest, back and front, where bronchial breathing is commonly heard transmitted from the trachea and its primary divisions. As a rule, it may, perhaps, be said, that the physical signs of pulmonary phthisis, which are heard in the adult at the apex of the lung, are of value in the child chiefly when they are met with in other parts, and especially at the base. When the bronchial glands are enlarged there will be dulness on percussion between the scapulæ, and, if the lungs are free, resonance over other parts of the thorax, with tolerably good respiration.

When the bronchial glands are extensively tuberculized—*bronchial phthisis*, as it is sometimes called—the symptoms often set in after one or more attacks of bronchitis, there seems to be a liability to frequent attacks of catarrh, the respiration becomes more oppressed, but the symptoms subsequently vary according to the state of the glands involved, for if they become much enlarged, then other parts are encroached upon and symptoms result accordingly; for instance, we may get venous turgescence from obstructed veins, and then hæmorrhage from the nose or the lungs may take place; or, if the nerves are pressed upon, we get violent paroxysms of spasmodic cough, with dyspnœa, stridulous breathing, and sometimes a good deal of pain about the chest. The voice is also hoarse, and occasionally lost altogether.

The signs special to this state of things besides those above enumerated are—marked dulness over the situation of the glandular enlargement, that is, in the middle of the sternum at the bifurcation of the trachea; there is here also intensely loud snoring respiration, with feeble sounds beyond, owing to the occlusion from the enlarged glands; or if there be no pressure, then the respiratory sounds will be very hard and bronchial. In some cases the lungs are involved as well as the bronchial glands, and then the symptoms of both will be present; but the latter may exist without the former. Death may occur from bronchitis; or from hæmorrhage—the suppuration in some bronchial gland having involved a blood-vessel; or the powers of life may be gradually exhausted, and the child at length die in a state of extreme weakness and marasmus.

Diagnosis.—In diagnosing this disease our opinion must largely be influenced by the previous history of the patient and the parentage, by the constitutional characters, and present symptoms: if there be loss of flesh and strength, a dry short cough, feverishness at times, difficult or hurried breathing, a quick pulse and hot skin, we may well suspect this mischief, and especially if all these symptoms have come on after an eruptive fever or some other disease. The diagnosis must, however, ultimately turn upon the issue of the chest examination. If there be dulness anywhere, with at first dry rhonchus, and afterwards mucous râles, or in place of the latter great extension of the former, we may fear the worst. Pulmonary phthisis may be mistaken for remittent fever in its early stages; but it is distinguished by the gradual onset and progress of the symptoms, the much less heat of skin, the absence of delirium, and the auscultatory signs. It is very important to distinguish between simple pneumonia and that which often complicates phthisis in early life: in the latter, the heat of the body is less than in the former, the difficulty of breathing is out of proportion to the severity of the pneumonic signs, the pulse is less frequent, and there is often an hereditary tendency to tuberculosis—as disclosed by the history.

There is one other disease which is likely to be mistaken for pulmonary phthisis—viz., scrofulous pneumonia. This differs so materially from ordinary pneumonia in regard to its clinical features, the slow progress of the symptoms and the comparative absence of febrile disturbance, that a mistake of this kind could hardly be made: but in regard to tubercle a mistake is quite possible. We must then rely very much upon the previous history and the absence of any general signs of tuberculosis. Scrofulous pneumonia more often affects one than both lungs; and though the physical signs may very closely resemble those of phthisis, the absence of general symptoms to agree with these is in favour of the former disease.

Prognosis, &c.—This is always unfavourable, though recovery is not hopeless. Sometimes phthisis runs a very rapid course in the young; the average duration is estimated by MM. Rilliet and Barthez at from three to seven months, although it may prove fatal in two months, or it may be protracted for three or four years.

In the early stages of the disease, we may reasonably hope to effect a cure, especially if there be no hereditary tendency, and if the disease has apparently come on as a sequela to measles; we must remember, however, that as a rule the disease runs a more rapid course in the child than in the adult, and that tubercular deposit in other organs is very much more common in the child, and seriously interferes with recovery.

Causes.—Hereditary influence, cold and damp air, improper artificial nourishment—or a bad quality of the mother's milk, and anything which interferes with the proper nourishment of the body—as prolonged diarrhœa, &c., are fruitful causes of the malady. The practice of bleeding in some of the disorders of infancy, will also, it is to be feared, predispose towards it: and thus may be explained the fact of its occurrence after an attack of acute pneumonia. The pneumonia may only be a secondary occurrence; but there are many who believe that it brings on the disease, though it is not clear how it can do so except by the vital depression which the inflammation and the remedies used to combat it produce. Quite recently Dr. Andrew Clark has asserted that the introduction of dead animal matter into the circulation will give rise to pulmonary deposits, and if the child has a bad constitution, these may assume a tubercular character. He believes, too, that such animal matter may come from diseased tonsils, and by being absorbed into the pulmonary circulation, may there set up an inflammation which will in the main resemble pulmonary phthisis, and follow a similar course. Lastly, some authors look upon phthisis as one of the manifestations of hereditary syphilis.

Morbid Anatomy.—Both lungs usually present numerous miliary, opaque, greyish or yellowish granulations, varying in size from a millet or hemp seed to a large pea, and are either collected together in one mass, which may be of almost any extent, or they are scattered through the lungs, but are usually most abundant in their upper lobes: they are the grey or miliary tubercle.

The actual seat of these deposits is in the interstices between the air cells, and also under the submucous tissue of the minutest bronchial tubes. It is not often that we meet with the disease in this stage, or at least if it be so in some parts of the lung it is very different in other parts, where the disease has advanced to what is called the second stage, which indicates that these deposits have undergone a process of softening. This usually commences in the centre of the mass, and, as it extends, it probably eventually empties itself into one of the bronchial tubes, and is then ejected. This goes on in all the deposits so that the part of the lung involved becomes, as it were, riddled with small cavities of about the size of a pea or a nut. Eventually these smaller cavities coalesce, so that one large vomica is formed, and thus the third stage is constituted.

In the pulmonary tissue about these deposits and cavities, plastic elements of a more or less inflammatory character are formed. Sometimes, when the tubercular matter is deposited near the pleural surface, and has undergone softening, perforation of the lung takes place, or adhesions are formed between the visceral and costal pleuræ, and thus speedily fatal issue is for a time averted. The bronchial glands are almost always found greatly hypertrophied, and frequently they appear to be so infiltrated with tubercle, that none of their normal tissue can be detected: occasionally also softening is found to have commenced in them.

There is another kind of deposit not uncommonly met with in children, though it is somewhat rare in after-life: it is that which characterizes scrofulous pneumonia, and though it most frequently exists alone, it is occasionally associated with tubercular deposit, either of the yellow or grey variety. Indeed it would appear sometimes to be the determining cause of pulmonary tuberculosis, though it must be admitted that in their general pathological characters and tendencies, the two diseases are not only distinct but somewhat opposite.

Softening of the effused material takes place rather more rapidly in this than in the purely tubercular deposit, and inasmuch as the extent of the deposit is greater in the former than in the latter, the softening is also more extensive, and the resulting cavities are proportionally larger.

Lately, a good deal of attention has been directed by Dr. Andrew Clark, to another pathological change, or what is assumed to be another, and to which the term *fibroid phthisis* is applied; the name tolerably well explains the condition. The lung is solidified and the effused product has, to a great extent at least, a fibrillated appearance. These fibrillæ form septa which pass through the deposit in various directions, and give to the lung an appearance different, it is said, to that of either of the conditions described.

Lastly should be mentioned the fact, that occasionally the cavities, which we have described as resulting from the process of softening, undergo a shrinking process, their walls cicatrize, and the cavity is obliterated: in other cases the tubercles shrivel, dry up and cretify, or become little hard lumps of callous material.

Treatment.—The principles of treatment are the same at every age. Where there is an hereditary tendency to phthisis, great attention should be paid to prophylactic measures; the infant should be nursed by a strong and healthy young woman, should be warmly clothed, be taken into the open air as much as possible in fine weather, be kept in properly warmed but well-ventilated apartments, and be carefully watched at the periods of dentition, weaning, &c. He should also be jealously shielded from all contagious disorders; and should he unfortunately suffer from hooping-cough, from either of the eruptive fevers, or from attacks of diarrhœa, or even from catarrh, no lowering measures may be resorted to: on the contrary, judicious attempts should be made to support the system while the disease itself is being treated. Warm applications to the chest in the shape of linseed-meal poultices are very soothing and beneficial. If the cough be troublesome and the expectoration scanty, stimulating expectorants, combined with soothing remedies, will sometimes do good service.

Great caution is needed in regard to the use of the so-called counter-irritants. Blisters ought never to be employed for this disease in children, but the repeated application of iodine, combined with the extract of belladonna, has seemed to do good in some cases.

When tubercular matter has become deposited in the lungs or bronchial glands—we must endeavour to improve the general nutrition by attention to the quantity and quality of the food, by pure mild air, and by the administration of bark, steel, and cod-liver oil. Occasionally our attempts to impart strength by nourishment are foiled by the total want of appetite, or by the inability of the stomach to digest the food put into it: the result being the same whether the child takes insufficient aliment, or whether disease prevents the proper assimilation of that which is taken. Where there is a loss of appetite, the dilute nitro-muriatic acid, with gentian and syrup of ginger, will often do good. But if there be an imperfect secretion of gastric juice, few remedies promise more favourable results than pepsine. Two grains may be given twice or thrice a day with the meals to an infant twelve months old. If the pepsine of the pig is used, as it is much stronger, one grain will suffice. Should this remedy fail, raw meat or prepared bullock's blood may be tried : but these remedies are probably more useful after dysentery than in simple phthisis. Great attention must be paid to the state of the bowels and secretions ; purgatives, as such, should be avoided, but an occasional alterative will do good service. If, however, the bowels are relaxed, the dilute sulphuric acid, with cardamoms and syrup of ginger, will be beneficial. Change of air is an important agent in relieving the pulmonary consumption of children: the atmosphere of many parts of Italy, of the South of France or England, is suitable. In our own country the preference should be given to Bournemouth, Hastings, Torquay, and the Undercliff of the Isle of Wight. In selecting a climate for a consumptive patient, we should have regard to the state of the lungs ; if there be much irritability of the mucous membrane, a warm and moist atmosphere is preferable, but as a rule the drier the air the better, except in cases where the cough is very troublesome. Where the disease is far advanced, a warm atmosphere is absolutely necessary. Dr. Buchanan has lately drawn attention to the prevalence of consumption in places lying low, with a moist warm atmosphere.

With regard to the three medicines—bark, steel, and cod-liver oil —it may be well to mention that the following is the best way of administering them :—About every eight hours a dose of the tincture of bark should be given, with some cod-liver oil floating upon it ; then twice in the twenty-four hours the ammonio-citrate of iron may be administered in solution, taking care that it is given with a meal, and with an interval of at least four hours from the administration of the bark. Where the oil disagrees, some have found it advantageous to introduce it into the system by inunction ; which may generally be best effected by mixing it with an equal quantity of the compound iodine ointment, and ordering it to be rubbed into the back of the thorax night and morning. Dr. Buchanan and others have recommended the administration of alkalies, the former, indeed, believes in their speedy action, and says he has seen much good result in a very few weeks. The late Dr. Fuller, on the other hand, strongly recommended sugar in the place of cod-liver oil ; it also should be given with or immediately after meals.

If there be much cough, very small doses of morphia with chloric ether and hydrocyanic acid will give great relief ; if there be diarrhœa, it will most likely be checked by enemata of starch with a few drops of tincture of opium, or the compound aromatic chalk powder with krameria, or catechu and paregoric, will be useful. If there be night-sweats, the mineral acids may be given with the bark.

We have found the oxide of zinc most efficacious in checking these perspirations; one or two grains at night in powder may be given to a child of four or five years of age. In cases complicated with pneumonia, the bark and steel must be discontinued; and we must trust to small doses of iodide of potassium, to emetics of ipecacuanha, or, if there be much debility, to ammonia, squills, and senega.

Where it is known that a child has a phthisical tendency, great care should be taken to prevent, so far as may be, its development. For this purpose the child should avoid a cold and damp atmosphere, and equally a close and impure one. If the chest be long and narrow, exercises should be practised, with a view to its expansion, but the child's strength must not be over-taxed. Tepid baths and friction of the skin will do good. The clothing should be warm and free from restraint, especially as regards the respiratory movements. The diet should be most nutritious, and with a good allowance of the fatty compounds.

XII. SPASMODIC ASTHMA.

A large number of cases of spasmodic asthma occur in early life, and whilst the symptoms are somewhat identical with those of later years, the exciting causes may be limited to hereditary predisposition, cold, constipation, and indigestion.

Symptoms.—These may be latent until the fifth or sixth year, when there is noticed a gradually increasing dyspnœa and other chest symptoms. The attack may be sudden, coming on after meals, the recumbent position, some effort, or other cause. It generally, however, sets in between two and three o'clock of the morning, and is characterized by a sense of suffocation, want of breath, tightness and oppression across the chest, and the desire to obtain fresh air. The child starts up suddenly, throws his arms about, and makes violent efforts to breathe: soon there are signs of non-aëration of the blood, the extremities become cold, the pulse is small and quick or irregular, inspiration is short and abrupt, expiration is greatly prolonged. After struggling for some time and exhaustion is imminent, a fit of coughing generally terminates the attack. During the intervals, the patient enjoys good health, when no organic lesion is present, and has some immunity for a time from a recurrence of the paroxysm.

Prognosis.—It is rare for death to occur during a fit. The younger the subject, the longer the intervals during the paroxysm, the absence of organic changes, and the discovery of the cause, are factors tending to a favourable prognosis.

Treatment.—An impending attack may be prevented by applying heat to the body, cold to the spine, or by the inhalation of stramonium or belladonna. During the attack, any exciting cause should be removed; there should be a plentiful supply of warm fresh air;

and the sitting or kneeling position, with the shoulders raised, should be adopted; depressants, sedatives, antispasmodics, or stimulants may be administered, according to the nature of the case. Inhalations of chloroform, ether, &c., have been found most useful. Nitrate of amyl has been successfully employed. In the intervals, the general system must be strengthened, the functions of the body regulated, and everything avoided which tends to produce an attack. Quinine, strychnia, and other tonics, will be found serviceable. Lately, iodide of potassium has been recommended in large doses.

XIII. ECZEMATOUS ASTHMA.

It has been remarked by Dr. West, "I have never known eczema to be very extensive and very long continued without a marked liability to asthma being associated with it. It cannot, however, be said that the two conditions always alternate, the asthma being worse when the cutaneous affection is better; but the radical cure of eczema is usually followed, though often not till after the lapse of three or four years, by the cessation of the liability to asthma."

Treatment.—In this case, our object should be to *gradually* overcome the eczematous condition, by cod-liver oil, iron, and gentle inunctions of mercury. Any hurried proceedings will but augment the asthma.

XIV. NOCTURNAL COUGH.

Children are liable to a peculiar nervous cough shortly after the period of lactation has been completed. It is characterized by coming on only during the night, and is generally observed in those who are anæmic, readily fatigued, and who suffer from cold feet towards the evening. It is most prevalent in spring and winter, though it may occur in the other seasons. Boys are more liable to it than girls. It tends to disappear entirely, and in some cases spontaneously.

Symptoms.—A child, after sleeping for some hours, begins to be restless and to cough, and only wakes after the cough has lasted for a time. The cough is short, teasing, and dry, and marked by the absence of expectoration and dyspnœa. It ceases after an hour or two, but recurs the following night. This state of affairs may continue for weeks without seriously undermining the general health. During the day, the child is lively, and enjoys its food.

Treatment.—The clothing should be warm, the diet liberal with moderate stimulation, the bowels regulated, a change of air effected without delay, and the nocturnal paroxysms cut short by full doses of bromide of potassium and chloral hydrate.

CHAPTER III.

DISEASES OF THE CIRCULATORY SYSTEM.

I. INTRODUCTORY REMARKS.

DISEASES of the heart and its serous covering, the pericardium, are very much more rare in the early years of life than they are after puberty; the explanation of this is due no doubt partly to the fact that rheumatism is not frequent in childhood, partly also because renal diseases are uncommon in early life, and partly because fatty degeneration of blood-vessels belongs especially to the later periods of life. On the other hand, we have sometimes to combat the distressing results produced by congenital malformations, which give rise to a large number of cardiac affections. These malformations not only produce very great suffering in themselves, but they seem to predispose to various inflammatory and other affections of the heart.

To show how rarely diseases of the heart occur in childhood, we may state that from the Report of the Registrar-General for 1876, it appears that of 31,951 deaths of all ages in England from diseases of the organs of circulation, only 338 occurred under five years of age; of these latter, 25 only were from pericarditis, and 313 are set down as "Heart Disease," &c. From five to ten years of age there were 1,066 deaths from this cause, and of these 77 were attributed to pericarditis.

It must not, however, be supposed that these figures represent at all fairly the frequency of cardiac disease in early life; on the contrary, we know that pericarditis and endocarditis, to say nothing of the various congenital malformations of the heart, occur sufficiently often in childhood to make their study a matter of great interest and importance. In considering the pathology of chorea we pointed out the relation which it bears to rheumatism as a cause, and we may also here allude to the fact that a very close relationship exists between chorea and cardiac disease.

From a large number of cases cited by different authorities, we find that some affection of the heart exists in at least two-thirds of choreic cases; but here a caution is necessary, in reference to this matter, for the mere existence of a cardiac murmur is by no means sufficient to establish the diagnosis of heart disease. There are, as is well known, many cardiac murmurs which are entirely independent of any organic disease, and these are perhaps more frequently met with in chorea than in any other affection, though still in them they are not common. In such cases, the cure of the chorea is followed by a cessation of the murmur, and sometimes the latter will cease even though the former remains, if the general condition of the patient be greatly improved; it almost always happens that these non-organic murmurs are due simply to a vitiated or impoverished state of the circulating fluid, and that is just the condition most favourable to chorea. Where, however, the murmur persists despite the improvement in the patient's health, the suspicion of its organic character would necessarily be strengthened.

Dr. Andrew, in the first volume of the St. Bartholomew's Hospital Reports, has suggested another cause of these inorganic murmurs. He says that it may result from an irregular contraction of the heart, by which the natural orifice is changed from oval to round, and through which, therefore, regurgitation would be possible. It is well to bear this in mind, especially in choreic cases, since in them, if at all, we might look for such irregular contractions.

But after eliminating all these cases of non-organic cardiac murmur in chorea, there yet remain many cases in which organic heart disease complicates chorea, though which is to be regarded as antecedent, and whether they are in any way related, or are merely coincident, it is perhaps at present impossible to say. It may further be stated that, admitting the comparative rarity of heart disease in childhood; we must nevertheless allow that it is far more common than was formerly supposed, and may perhaps be still more so, if carefully sought after. The disease most frequently met with is no doubt endocarditis; next to that comes pericarditis, and lastly carditis. This latter is, however, so extremely rare, as scarcely to need any consideration in a treatise of this kind. Indeed, it very rarely occurs as a distinct affection, but is generally combined either with pericarditis, or with endocarditis, or both. We will take the other two in the order of their relative frequency.

II. ENDOCARDITIS.

Endocarditis, or inflammation of the interior lining membrane of the heart, occurs more frequently in children than is commonly supposed. It is by no means necessarily connected with rheumatism, although that is by far the most frequent complication; but it may arise in the course of scarlatina, of measles, and also of continued fever. It sometimes occurs idiopathically.

In regard to the *Symptoms* of endocarditis, it is important to bear in mind that this disease may come on so insidiously and be accompanied, at first by such slight disturbance, that it is very apt to be overlooked. Hence the necessity in all cases of febrile disturbance, however slight, of a careful examination of the chest with the stethoscope. It is the one thing which alone can determine the diagnosis, and without it no really trustworthy opinion can be formed.

The early symptoms of endocarditis, whether the affection occurs in the course of any other disease or not, are, in addition to the ordinary phenomena of inflammation—which may in this disease be either exceedingly mild or very severe—increased frequency of pulse with occasional palpitation, irregularity of the heart's action, increased impulse with throbbing along the carotids, and more or less dyspnœa. In some cases the general distress is very great, in others it is so slight that the nature and gravity of the case may be entirely overlooked, and will probably not be recognized till some time after, when a loud cardiac murmur reveals what has taken place.

If we apply the hand to the chest in simple endocarditis, or in carditis, the action of the heart will appear to be very violent; sometimes a vibratory thrill will be felt. Percussion often discovers an augmented extent of dulness in the præcordial region; this dulness may be distinguished from that caused by pericardial effusion, by the beat of the heart appearing superficial instead of remote and distinct. If we listen to the heart's action we shall detect a bellows-murmur, the most constant and characteristic of the phenomena of endocarditis. If the murmur be systolic, most distinct at the base and along the course of the aorta, and accompanied by a small pulse, it is significant of *aortic obstruction;* if systolic, most distinct at the apex, and with an irregular pulse, it is due to *mitral regurgitant* disease. A diastolic murmur, most distinct from the centre of the sternum (on a level with the third intercostal space) upwards towards the base, with a jerking pulse, is indicative of *aortic regurgitation;* while a diastolic murmur, most distinct from the fourth left intercostal space downwards towards the apex, with an irregular small pulse, is the result of *mitral obstruction.*

The *Terminations* of acute inflammation of the lining membrane of the heart, or of the heart's substance, are permanent valvular disease, followed by implication of the heart's substance with dilatation of the cavities, and all their combined consequences—as general anasarca, &c. Death rarely occurs from the acute disease. The *Prognosis* in valvular disease is less unfavourable in children than in adults.

When, as the result of the inflammation, fibrinous concretions take place upon the valves, portions of these sometimes get detached, and, for a while, float in the circulating fluid, until perchance they are arrested in some arterial branch, which is immediately plugged up. The consequences of this will vary according to the part supplied by the occluded vessel.

The *Treatment* of endocarditis resolves itself for the most part into the treatment of the affection of which it forms one of the complications—rheumatism, scarlatina, measles, continued fever. The reader is therefore referred to the chapters in which those diseases are considered. There are, however, some remedies of special value in the cardiac complications; and foremost among them are the so-called counter-irritants, from which we have certainly derived benefit. A blister is in our opinion of most value, if the child be not too young; he certainly ought not to be less than five years old, and even then it requires watching to prevent the formation of a slough. There is this further drawback to the use of blisters—viz., that the part is thereby made so sore that we cannot use the stethoscope till it has healed.

Warm, soothing fomentations of poppy or laudanum, and linseed poultices, are of great service, and afford much relief. Opiates internally are also useful, and aconite possesses an undoubted power of lowering the pulse and regulating the heart's action. It is therefore of great value in these cases. The dose is half a drop to a child three years of age; the same, though in a less degree, may be said of hydrocyanic acid, which is taken in rather smaller doses. Rest, and light but really nutritious diet, will aid us much; stimulants are occasionally required in rather liberal quantities.

III. PERICARDITIS.

Pericarditis, or inflammation of the external serous membrane covering the heart, may arise from cold, from mechanical injury, from a contaminated state of the blood produced either by renal disease, by the poison of scarlatina, or measles, but more particularly by that of rheumatic fever. With regard to the latter, it must not be forgotten that in children the heart is liable to be affected even when the rheumatic symptoms are very mild; consequently every case in which we have reason to suspect the existence of rheumatism must be most carefully watched, especially as regards the state of the heart; we ought to examine this organ stethoscopically every day at least, since even in the very mildest cases mischief may be going on there when least expected.

Nor is it only in cases of rheumatism that all this care is needed, for in a few cases of scarlet fever, in some of measles, and in more of continued fever, cardiac complications are apt to arise. More often still, in regard at least to pericarditis, inflammation is liable to run from the pleura to the cardiac serous membrane; we ought therefore to be especially on our guard when the pleurisy is on the left side of the chest, and our suspicions should be aroused if the child becomes more than usually restless, fidgety, and distressed. These cases are probably not associated with any special blood poisoning.

The *Symptoms* of pericarditis are the same at all ages, allowance being made for the child's difficulty in referring to the seat of pain, &c. The most constant and prominent symptoms, are inflammatory fever; pain referred more or less distinctly to the region of the heart, often darting through to the left scapula, or upwards to the left clavicle and shoulder, and down the arm; violent palpitation, the motions of the heart being tumultuous, and perceptible even at a distance from the patient; irregularity of the pulse; hurried respiration; incapacity for lying on the left side; strong pulsation of the carotids; anxiety of countenance; great irritability.

and restlessness; piercing and distressing cries; and, frequently, noises in the ear; giddiness; and epistaxis. As the disease advances, there is extreme debility, cough, suffocative paroxysms, occasionally a tendency to syncope, and œdema of the face and extremities. These symptoms are not only often masked in young children by many circumstances, but even in the adult they vary a good deal in different cases. Thus, as Dr. Hope has remarked, if the effusion which results from the inflammation consists almost entirely of coagulable lymph, or if the serum thrown out has been rapidly absorbed and adhesions early effected, the circulation will be less interfered with, and less suffering will result, than in those more formidable cases, where there is a copious fluid effusion painfully distending the inflamed membrane, pressing upon the heart, and embarrassing its movements. The symptoms will be more urgent if with the pericarditis there be also endocarditis or carditis.

Though the above mentioned symptoms would undoubtedly be strongly suggestive of pericarditis, we cannot arrive at a positive opinion, except by auscultation. We shall then find—in the earliest stages of the disease--increased intensity of the natural sounds; and if endocarditis co-exists, as it so frequently does, a loud systolic *bellows-murmur* will also be heard. Very early, too, a distinct *alternate rubbing*, or a *to-and-fro sound*, as Dr. Wilson terms it, will be audible. The bellows-sound indicates fibrinous deposits in the texture as well as on the surface of the valves, from inflammation of the internal membrane of the heart—the endocardium. The to-and-fro sound is indicative of inflammation of the pericardium; it generally ceases in a few days, when this membrane becomes adherent to the heart, as it always does if the patient survives. When copious effusions take place, we have dulness on percussion over a larger surface than in health; and as long as the fluid remains unabsorbed, a state of *hydro-pericardium* exists, which may prove fatal. The heart sounds in cases of effusion are generally very weak, and the impulse is also diminished.

There is often very great difficulty experienced in distinguishing between an endo- and an exo-cardial murmur, but where both layers of the pericardium are involved and lymph is formed upon each of them, the friction or rubbing sound is so loud and distinct it can hardly be mistaken. Moreover, in such cases, it can frequently be felt, as well as heard, by a kind of *frémissement*.

If we classify the physical signs of pericarditis, they will be as follows:—

1. Sensation of friction communicated to the hand. 2. Friction sounds, the "attrition murmurs" of Hope. 3. Extension of dulness over the cardiac region resulting from liquid effusion. 4. Friction signs, attended with—or preceded by—valvular murmurs. 5. Signs of eccentric pressure analogous to those of empyema. 6. Signs of excitement of the heart. 7. Signs of weakness or paralysis of the heart.

Prognosis.—Pericarditis—especially the rheumatic variety—is not so much to be feared for its immediate danger, though now and then it proves fatal, as for the traces of permanent injury which it leaves behind. The endocarditis which so frequently accompanies it produces especial mischief in the valves of the heart. The danger is great, however, when the morbid action is acute and general; or when it is set up in weak scrofulous children; or when it supervenes upon a severe attack of scarlatina or measles.

Treatment.—In no disease was the lancet used with a more unsparing hand in days gone by than in inflammation of the pericardium. More extended experience has shown us, however, that this heroic and sure method—as it was deemed—of extinguishing the morbid action, is not only uncertain but often highly dangerous. Formerly, too, we were taught the great importance of rapidly getting the system under the influence of mercury, after bleeding. But when we look to the authorities of the present day, what do we learn? The question is well answered by Dr. Markham, who says, "We find one of the most observant and practical physicians amongst us admitting that the firm faith which he himself once reposed in the efficacy of this remedy has been undermined by the truth-telling effects of further experience." The remarks which we have already made on the use of mercury in various inflammatory diseases quite confirm this opinion.

The treatment which we adopt is that practised by many for the relief of acute rheumatism:—the two principal remedies being opium, and the hot bath. From these agents we believe that we have seen the greatest benefit; and certainly in no instance have the remedies in question been prejudicial. They give great relief to the patient's sufferings, without inducing debility; and they in no way complicate the symptoms. The quantity of opium which will be needed for infants and young children will vary with the severity of the pain and the amount of restlessness; but in all instances very small doses must be given at first, the quantity being increased as the medicine seems to be well borne. Sometimes one hot bath suffices; in other cases it is necessary to repeat it daily for three or four times. Alkaline drinks—F. 240—will also do good.

In most instances it will be necessary to administer a few doses of some purgative; the neutral salts—F. 222, &c.—will generally agree well. At first the nourishment should be light, consisting of gruel, arrowroot, and mutton broth. Directly the strength begins to fail, however, the diet must be made more strengthening; and milk, strong beef-tea, and wine should be allowed. Dr. Stokes—speaking of this disease in adults—states that he is convinced patients are often lost for want of stimulation at the proper time; and he directs us to give support directly the pulse becomes feeble or intermittent, or the jugular veins become turgid, or pallor and coldness of the surface set in, or a tendency to faint upon exertion is manifested. "It may be laid down as a general principle that there is no local inflammation whatever, the mere existence of which should prevent the use of wine, if circumstances require it. In two cases especially —namely, cerebritis, and pericarditis—we find the greatest timidity in practice with respect to the use of wine. Yet even in the first case it may be required; and in the second its employment is imperative, when, as too often happens, excessive depletion has been resorted to." (Stokes.)

When the effusion into the pericardium is abundant, a blister may be applied over the præcordia; or a succession of blisters may be necessary. The iodide of potassium—F. 38—has been advantageously administered to promote absorption. It has been proposed —as a forlorn hope—in obstinate hydro-pericardium, to remove the fluid by paracentesis. M. Aran, physician to the Hôpital St. Antoine, Paris, relates a case of pericarditis with copious effusion, in a young man aged twenty-three, which he treated by an injection of iodine. The pericardium was punctured from below upwards with a capillary trocar in the fifth intercostal space, a little below the spot where the dulness on percussion was well marked; about twenty-eight ounces of a transparent reddish serum, were removed. A mixture, formed of four drachms of tincture of iodine, fifteen grains of iodide of potassium, and an ounce and a half of water, was then injected without causing any pain; a drachm or two was allowed to escape before closing the wound. The fluid having re-accumulated, the operation was performed a second time with a stronger injection, formed of equal parts (fl. oz. 1½) of tincture of iodine and water, with one drachm of iodide of potassium. The treatment was successful.

IV. HYPERTROPHY AND DILATATION OF THE HEART.

These cardiac lesions are comparatively rare. They may be forerunners of good or evil. Sometimes they admit of the functions of life being carried on during the developmental era of childhood, proving themselves conservative adjuncts until the *growing* heart shall have overcome early changes: sometimes they speedily usher in a fatal termination. They should always be carefully sought for in diseases of the heart, especially in valvular affections. As they seldom occur independently, we shall give the characteristic signs when they are both present.

Symptoms.—There is more or less dyspnœa, easily increased; uncomfortable sensations or severe pain over the cardiac region; palpitation; venous congestion; the quantity of urine becomes decreased and contains albumen in proportion to the extent of the dilatation; there is some bulging over the cardiac region; the impulse area is widened downwards and transversly; the cardiac dulness is more or less square in shape; the first sound is very loud, prolonged, and accentuated; if any murmurs are present, they will be intensified; there may be some displacement of neighbouring organs; the pulse tends to become more feeble, small, compressible and irregular, or intermittent.

The *Prognosis* must depend on the extent of the dilatation and its excess over the hypertrophy. The greater the dilatation the greater the danger. In adults, dilatation is always a very dangerous condition; we should, however, be inclined, whilst mentioning its extreme gravity, to look for some hope in the fact that we have to do with a structure rapidly passing through a stage of development, and hence that Nature might outstride the malady.

The *Treatment* resolves itself into enforcing *complete rest;* guarding against cold; regulating the diet; relieving pain and other unusual sensations by sedatives, as morphia and aconite; and any dyspnœa by digitalis and antispasmodics. Much relief is often experienced by the application of a belladonna plaster over the cardiac region.

CHAPTER IV.

DISEASES OF THE DIGESTIVE SYSTEM.

I. INTRODUCTORY REMARKS.

We have already seen in our remarks on the physiology of early life how strikingly peculiar are the digestive organs of infants and children, and in the following pages we shall have ample evidence of the influence of these peculiarities in inducing disease and death. Indeed, no better evidence can be afforded than the fact that of the 24,592 persons of all ages who died in the year 1876 from diseases of the digestive organs, no less than 5,181 occurred under fifteen years of age, and of these 3,334 were under one year. Referring to the causes of this high mortality, we find that of the 5,181 which occurred under fifteen years of age, 2,401 were due to gastritis, enteritis, and peritonitis; and 799 to jaundice; all which seems to show that delicacy of organization and functional activity are the two prime factors in the production of a high death rate.

In studying the diseases of the digestive organs, it will be convenient, we think, if we take them somewhat in their anatomical order; accordingly we will consider first the

II. DISEASES OF THE MOUTH AND FAUCES.

1. Fungous-Parasitic-Thrush, "White Mouth," &c. — This affection though very common in young infants, is important only as evidence of impaired nutrition and of a low condition of the vital powers. It is most frequently seen in infants who are artificially fed, or who are suckled by an unhealthy nurse.

Symptoms.—A child who is suffering from thrush is generally fretful and peevish, sometimes refusing his food apparently from the pain experienced in sucking; the bowels are often deranged and frequently relaxed. If we examine the mouth in such a case, we shall find the mucous membrane beset with numberless small white spots, looking like specks of curd, which are most abundant on the inside of the lips, the inner surface of the cheek, on the tongue, and in less quantity on the gums: these specks fall off, but are quickly reproduced. The mucous membrane is generally inflamed and angry-looking, dry, red, and hot: in severe cases the white spots coalesce, forming larger patches, so that the mouth and fauces are entirely covered, and the eruption may even extend down the throat. The motions are of a green colour and very sour, causing a redness and tenderness around the anal orifice. In such cases there is a good deal of constitutional disturbance, attended by fever and general depression, and it may even assume a malignant form in which there is a state of fœtor, the glands swell up, the secretions are offensive, the bowels much relaxed, and death from exhaustion may result.

The nature of this affection was unknown, until Professor Berg, of Stockholm, discovered, in 1842, certain microscopical parasitic plants—the *Leptothrix buccalis*, and the *Oidium albicans*—in the deposited specks; and it is now generally believed that these parasitic growths constitute the essential part of the disease, just as an analogous cryptogam gives rise to tinea favosa. The circumstances favourable to the development of this cryptogamic vegetation are —debility, disturbance of the digestive organs, and slight inflammation of the mucous membrane of the mouth and fauces with acid secretions. The thrush can hardly be said to be peculiar to infancy, since it not unfrequently becomes developed in adult age in the course of a prostrating disease; it is then often regarded as the harbinger of death.

Treatment.—Removal of the cause, attention to the digestive organs, and subsequently the employment of alteratives and tonics will be necessary. In mild cases, careful attention to the diet—for improper feeding is one of the most common causes of the disease—is often alone sufficient to effect a cure. Cleanliness both local and general, a healthy atmosphere, and proper hygienic management, are absolutely essential. As regards local treatment, we usually order the infant's mouth to be gently sponged with cold water after each meal; and direct that a solution of borax—30 grs. to water 1 fl. oz.—be freely applied twice a day with a sponge or camel's-hair pencil. The mel boracis, which is a favourite remedy with nurses, is thought by some authorities rather to favour the production of the confervæ, since like all matters containing sugar it soon undergoes fermentation. Speaking from our own experience, we cannot say that we have ever seen any evidence of this, on the contrary we have frequently observed great benefit from it, though we prefer a simple solution of the borax as being more easy of application. According to Sir W. Jenner, the application of a solution of sulphite of soda—60 grs. to water 1 fl. oz.—suffices to remove the disease from the mucous membrane of the mouth in twenty-four hours: the secretion of the mouth being acid, the salt is decomposed, and sulphurous acid is set free, which at once destroys the fungous growth. Guersent uses a solution of chloride of soda which he strongly recommends, while others employ chlorate of potash, or soda, alum, acetate of lead, and nitrate of silver in the proportion of two grains to the ounce; the latter more especially in cases of a severe malignant or gangrenous character. If there be any fœtor, a solution of the permanganate of potash will be most useful as a local application.

A mild alterative in the shape of two or three grains of grey powder, and a mixture of rhubarb and magnesia with a little ipecacuanha will be very beneficial. Should the disease assume a severe form, or the patient be much exhausted, tonics, and especially quinine and mineral acid, should be given.

2. STOMATITIS, OR INFLAMMATION OF THE MOUTH.—This affection is very common in young children. It may occur in various forms. In one the disease is a simple inflammation of the follicles of the mouth, which may or may not be accompanied by ulceration: in another a number of small ulcerations, commencing as minute whitish or whitish-yellow spots appear on the lips, cheek, palate, or tongue, and may become confluent; they are considered to be *vesicular*, to contain an opaque fluid, the vesicles ultimately rupturing; by some they are regarded as solid exudations under the epithelium, of a "croupous" or "aphthous" nature: and in a third we have an ulcerative—diphtheritic—gingivitis ulcerosa.

Follicular and aphthous stomatitis may be idiopathic, or may occur as a sequela of some of the eruptive fevers—as measles, &c. Children of a weak and relaxed habit seem peculiarly liable to these affections. The attention is first directed to the child's mouth by observing that a difficulty is experienced in sucking, that there is a more free secretion of saliva than usual, and that the submaxillary glands are swollen and tender. The patient is also restless and feverish, has but little appetite, and is evidently in pain during deglutition; there is also frequently diarrhœa with very offensive evacuations. On examination, numerous small white specks are found about the inside of the mouth, on the tongue, and on the fauces; these soon form ulcerations, and are covered with a dirty-white or yellowish slough. The ulcerations sometimes remain separate, and sometimes coalesce and form a sore of considerable extent; in either case, as they heal, fresh places appear, and so the morbid action continues for some weeks. When follicular stomatitis occurs as a concomitant or sequela of measles, it may become associated with diphtheria, producing an alarming malady.

When ulcerative stomatitis attacks the gums, the ulceration sometimes progresses to such an extent as to destroy these parts and denude the teeth. In all cases it produces great heat of the mouth, an increased flow of saliva, very offensive breath, swelling of the upper lip, and enlargement with tenderness of the submaxillary glands. On looking into the mouth, we shall see that the gums are swollen, red or violet coloured, that they readily bleed when touched, and are covered with a layer of pulpy greyish matter. If the disease be allowed to creep on unchecked, the gums will be destroyed by the ulceration, and the teeth become exposed and loosened, sometimes they even fall out; the morbid action also spreads to the inside of the cheeks, which become covered with irregular sloughing ulcerations, the breath is very offensive, and the tongue assumes a swollen and sodden appearance.

Ulcerative stomatitis is not uncommon; it occurs for the most part in weakly children who have been badly nourished and exposed to cold and damp. The amount of constitutional disturbance varies greatly; there is very seldom much fever, except where the ulcerative process is extensive, but there may be a good deal of diarrhœa, the evacuations being very offensive, and the abdomen much distended with flatulence. Moreover, from the inability of the child to swallow, owing partly to the state of the mouth, and partly, perhaps, to the disease having extended down the œsophagus, he soon becomes very weak, exhausted, and emaciated, and death may ensue.

So constantly does this disease result merely from improper feeding, that it sometimes suffices to take the child away from its nurse, and place it under good hygienic conditions, to effect a speedy cure. Every now and then, however, it occurs in the course of other exhaustive diseases, and seems to be a direct result of the loss of power. In other cases it appears to be due to contagion: at any rate it occurs in a good many cases where children are congregated together, as in foundling hospitals and the like.

Now and then it happens, in the course of the disease, that a redness and excoriation occurs at the margin of the anus, and hence some have thought that the disease extends down the alimentary canal, and so through to the anal orifice. This idea, however, is purely speculative, and rests upon no positive evidence; on the contrary, the evidence is opposed to this view, and it is more than probable that the excoriation in question is due merely to the irritative influence of the disordered excretions.

The *Treatment* of these diseases is not difficult, inasmuch as we possess in the chlorate of potash a remedy which may almost be deemed a specific. Two or three grains of this salt may be given every four or six hours to an infant one year old, in a little sugar and water. Great attention should be paid to the mouth, to keep it as clean as possible, otherwise the ulceration is apt to become very unhealthy; mucilaginous washes are good for this purpose. The diet must be regulated, and, if the breast-milk does not suit, other food must be chosen. If acidity exists, which it often does, a little magnesia will be of service, especially if it be given so as to clear out the alimentary canal of all offending material. As a local application, a solution of acetate of lead, two, three, or four grains to the ounce, applied carefully with a camel's-hair brush, has often proved of great service in our hands. If any thrush exists also, the borax solution may be used with advantage. In cases where the ulcerative process is sluggish and unhealthy looking, the application of a solution of nitrate of silver, three grains to the ounce, or of sulphate of copper, two grains to the ounce, will be very beneficial. Either of these applications are useful to the excoriations about the anus.

When the ulcerations have healed, bark or quinine should be administered, according to Formulæ 260, 265, 277, &c. Tonics will also be necessary in all cases where the strength is much exhausted; quinine is probably the best, but iron will be necessary if there be anæmia. Good diet, with some wine, should be given in these cases; broth or beef-tea may be required, or milk and lime water if there be any acidity.

3. GANGRENOUS STOMATITIS — CANCRUM ORIS — NOMA — WATER CANKER, is a much more formidable affection, and fortunately it is also very much more rare. It occurs in children between the ages of two and five years, who are either of a lymphatic temperament and therefore constitutionally weak, flabby, and of low vital power naturally; or who have been prostrated by some previous disease: hence it is, perhaps, most common after typhoid fever, measles, and small-pox. It has been erroneously thought to arise from the action of mercury: but even where this medicine has been given, the symptoms in all probability are not attributable to it. Very often it begins as simple stomatitis, but usually with a greater amount of general depression.

Symptoms.—The disease commences either in the mucous membrane or in the substance of the cheek, without pain, but with fœtor of the breath, and an abundant secretion of offensive saliva, the salivary glands are much swollen, the gums spongy and dark in colour, and many of the teeth are loose. The affected part soon becomes hard, red, shining, and tense; and, if the mouth be examined, a deep, unhealthy, excavated ulcer will be found, corresponding in situation with the external induration. This ulcer, with its jagged edges, quickly forms a perfect specimen of phagedænic ulceration: it gives rise to a most horribly offensive dirty-coloured discharge: the gums sometimes become so involved that necrosis of the jaw may ensue. Occasionally the whole cheek becomes black and gangrenous, so that the cavity of the mouth is exposed, and a frightful spectacle is presented, which with the horrible stench is most distressing. The constitutional disturbance is very great, the skin is hot and dry, the pulse grows more feeble as the disease advances, until death relieves the sufferer; for unfortunately but few cases recover. There is, however, very slight pain; and the appetite often remains comparatively good, even although deglutition is very difficult.

Treatment.—The only hope of successfully treating this disease lies in the free and early application of some powerful caustic to the sloughing ulcer: an operation which can hardly be performed without the aid of chloroform. The best caustics which can be employed are the strong hydrochloric and the fuming nitric acids; they should be carefully but freely used, and may be re-applied at the end of twelve hours, if the ulceration be not checked. Subsequently, the mouth must be syringed frequently with warm salt water, or with a weak solution of the liquor sodæ chlorinatæ—fl. oz. 1 to water fl. oz. 12, or with a gargle of hydrochloric acid, made of three fluid drachms of the dilute acid mixed with eight fluid ounces of water. During the whole progress of the disease, the chlorate of potash in large doses, with quinine or the tincture of bark—F. 265—should be given; not that this potash salt is likely to be as efficacious as it is in ulcerative stomatitis, but still there is a reasonable hope of its being useful. Wine, with nourishing liquid or solid food, must also be given; and in many cases the mistura spiritûs vini gallici of the Pharmacopœia will do great good, especially if it be freely and perseveringly exhibited.

4. MERCURIAL STOMATITIS.—This rare affection is due to some accidental coincidence or individual idiosyncracy. It is characterized by redness and swelling of the gums, increase of saliva, and the breath has a peculiar unpleasant odour. There may be great inflammation of the mouth and tongue, followed by ulceration, suppuration, or even gangrene. The salivation may become very profuse, with much pain about the mouth and face, stiffness in moving the jaws, dysphagia, and difficulty in speaking. The *Treatment* consists in the immediate discontinuance of any preparation containing mercury, the eliminating the drug from the system by purgation, and the local application of gargles to soothe and aid in healing the inflamed and ulcerated state of the mouth.

5. CYNANCHE TONSILLARIS.— Cynanche tonsillaris, tonsillitis, quinsy, or inflammatory sore throat, is seldom seen in children under twelve years of age. It manifests itself by smart fever, redness and swelling of the fauces and tonsils, difficult delgutition, together with—in severe cases—pain shooting from the throat to the ear, along the course of the Eustachian tube. Dyspnœa is but rarely present. Under ordinary circumstances, the inflammation runs a certain course, and terminates by resolution in a few days, merely leaving the tonsils enlarged: when violent and prolonged, it frequently leads to suppuration in one or both tonsils, usually preceded by a rigor, and accompanied by rather severe pain, which continues until the abscess bursts, or is opened artificially.

The principal exciting *Cause* of quinsy is cold. The liability to it is increased by repetitions of the attacks. It is doubtful whether it be contagious or not; but we are inclined to believe that it is, though this opinion differs from that entertained by many practitioners.

Treatment.—Rest in bed, light diet, an emetic at the onset of the attack, followed by cooling saline purgatives, and hot fomentations or linseed-meal poultices to the throat, are the proper remedies for tonsillitis. The steam of hot water applied to the fauces gives great relief. Blistering the outside of the throat, if the case be a severe one and the child be old enough for such treatment; or friction with stimulating embrocations—as the compound camphor liniment—or the application of iodine paint, will often be useful, especially if the inflammation becomes chronic, and seems leading to enlargement of the tonsils. Guaiacum in full doses has been recommended as a specific in quinsy, but we have never found it of any service, unless it produced purging; and this is often better induced by other remedies.

6. HYPERTROPHY OF THE TONSILS sometimes results from previous inflammation; but it may come on slowly—perhaps during dentition—without any such evident cause, and seems in the majority of cases to have a distinctly constitutional origin, usually of a strumous or scrofulous character. In severe cases, the enlarged glands push up the velum, and so obstruct the passage of air through the posterior nares. Hence the voice is rendered thick, there is snoring during sleep, deafness caused by pressure on the Eustachian tube, cough, and sometimes dyspnœa. The snoring during sleep is perhaps one of the most constant, as it is one of the most noticeable symptoms, and as the disease in question is frequently almost unattended by any other symptom, we ought never to disregard it, at least not until we have satisfied ourselves that tonsillar hypertrophy is not the cause of it. The cough which sometimes exists is very troublesome; it comes on in paroxysms, and is frequent and irritating. If the tonsils are allowed to remain, they occasionally induce a flattening of the chest from side to side; probably because sufficient air cannot be taken in with each inspiration to cause a pressure from within the lungs equivalent to the atmospheric pressure without; hence deformity results. In very severe and urgent cases it has been necessary to relieve the dyspnœa consequent upon the pressure by the tonsil, by the performance of laryngotomy.

The *Treatment of hypertrophied tonsils* varies with the degree of enlargement. If this be slight it may be disregarded. If it be chronic and is apparently constitutional, cod-liver oil, the iodide of iron, quinine and animal food, with the application of iodine, internally or externally, will probably suffice to cure it. But if the enlargement really causes pressure or obstruction of surrounding parts, and does not yield to the remedies suggested, it must be removed with the knife. The effect of this is sometimes very remarkable. Mr. Shaw describes a case in which the dyspnœa had produced a decidedly pigeon-shaped chest, which, however, entirely disappeared some time after removal of the tonsils. Deafness in like manner is frequently curable by removal of enlarged tonsils; and as the operation is not a dangerous one, while the results are so very satisfactory, we need not hesitate to recommend its adoption in every case where there is evidence of pressure, or where it provokes a troublesome irritating spasmodic cough, or especially where there is any family history of phthisis.

7. RETRO-PHARYNGEAL, OR ŒSOPHAGEAL ABSCESS.—This is the result of inflammation and suppuration of the loose areolar tissue situated between the posterior surface of the pharynx or œsophagus and the spine; and to Dr. Fleming is due the credit of first clearly describing it, and of showing that it sometimes occurs during infantile life. It may arise idiopathically, the patient being generally in an enfeebled state of health; or in connection with dentition; or as

abscesses often do in other situations, as a sequela of fever; or as a result of disease of the cervical vertebræ; or, lastly, it may have a traumatic origin, being the result of a blow, a stab, or from the lodgment of a foreign body in that situation.

Symptoms.—The characteristic symptoms are preceded by general disturbance and fever, varying in intensity according to the constitution of the child. Indications of difficulty in swallowing and breathing soon manifest themselves; the latter speedily becoming so severe, particularly when the child is placed in the recumbent posture, that suffocation may even appear imminent. There is also a fixed and retracted state of the head, with rigidity of the muscles at the back of the neck; a more or less locked state of the jaws; a remarkable articulation—in children old enough to speak—the words being drawled out with pain and difficulty; the painful deglutition increases, until solids are refused and liquids regurgitated through the nose; frequent spasmodic attempts are made to swallow, as if there were something in the mouth; and on examining the fauces, a firm projecting round tumour is felt just beyond the base of the tongue, occupying either the median line, or inclined to one or other side. Sometimes the swelling is visible when the mouth is wide open, and may be seen pushing forwards the posterior wall of the gullet, and even pressing upon the larynx; hence the difficulty both in respiration and deglutition: the former being sometimes so great that operative interference is imperatively called for to avert suffocation.

Diagnosis.—The symptoms at first sight are very apt to be attributed to some cerebral affection. Attention to the phenomena just described, the cessation or diminution of the difficult breathing when the patient is raised from a recumbent to a sitting posture, with a careful examination of the throat, will generally remove all doubt as to the true nature of the case. Occasionally, however, the case is by no means so clear, and not until death has taken place has its true nature been revealed. This is no doubt owing to the variableness of the symptoms, for while with one there may be extreme dyspnœa, with another this may be entirely wanting, and the same applies to the question of deglutition.

Treatment.—In the early stage, cold compresses should be applied; and if the symptoms be acute, the compresses should be changed frequently. The patient should be induced to swallow small pieces of ice, or, if too young, iced-water should be injected against the pharynx. When suppuration has commenced, it should be encouraged by warm fomentations or poultices, as soon as the abscess is fully developed, surgical interference soon effects a cure. The abscess should be opened with a bistoury, shielded to near its point by lint or plaster. The incision should be kept open for some days —an occasional pressure of the finger is sufficient to effect this— and the throat should be well syringed with tepid-water. Any slight bleeding following the operation is easily controlled by cold injections; we must not, however, forget the proximity of the internal carotid artery. Care should be taken that no pus enters the trachea, at the time of operation, as it might cause death, or at least an attack of pneumonia. When the abscess is situate so low down that a knife cannot with safety be used, Dr. Fleming recommends the employment of a curved trocar, introduced down the throat. It need hardly be added, that we ought to be quite sure in our diagnosis before resorting to such interference, as the line between safety and danger is very slight indeed. If the abscess be due to caries of the vertebra, it should only be interfered with under circumstances of imminent danger. A spontaneous opening rarely occurs, though it does sometimes, and in any case the relief which follows the evacuation of the matter is prompt and complete. The rest of the treatment consists in maintaining the patient's strength. The diet should be the best of its kind, and should be highly nutritious as well as moderately stimulating.

8. CYNANCHE PAROTIDEA.—Cynanche parotidea—parotitis—or mumps, is a common disorder of childhood, after the fifth or sixth year; and consists of a specific, contagious, inflammatory affection of one or both parotid glands. The disease may occur as a sporadic affection, or it may prevail as an epidemic. It first manifests itself by slight febrile disturbance, followed at the end of twenty-four hours by stiffness of the neck and lower jaw, with tumefaction and soreness in one or both parotid regions; after a while the swelling sometimes extends from below and in front of the ear, along the neck to the chin, and involves the sublingual and submaxillary glands generally, so that the entire throat and face is greatly swollen. The disease usually reaches its height in about four to six days, and then declines; sometimes disappearing entirely in two or three days. In some cases, however, it runs a much slower course, the swelling not reaching its maximum till a week or more, and not terminating for two or three weeks. It is seldom that suppuration occurs, unless there is a very decided scrofulous taint, or the case has been grossly mismanaged; in one such it seemed to result from the application of leeches. Occasionally in adults the testicles or mammæ become painful and swollen: but either of these occurrences is very rare in children.

The *Treatment* consists generally in the early adoption of the so-called antiphlogistic regimen, and the employment of hot fomentations to the throat. When the pain is severe, which, owing to the abundance of fibrous tissue present in the gland, is not unfrequently the case, great relief is obtained by adding opium to the poultices. If the swelling continues for some time and seems callous and indifferent, the moderate use of iodine externally will do good, together with the administration of iodide of iron internally.

III. DISEASES OF THE STOMACH.

1. INDIGESTION.—The word Indigestion is employed to designate a very common affection of infancy, the prominent symptom of which is vomiting. Indigestion and vomiting may result from many causes; sometimes it arises from mere repletion, in which case the overloaded stomach takes the easiest means of relieving itself; sometimes from the irritation of improper food, as when weaning is too suddenly practised; or the stomach may sympathize with disease elsewhere: thus, vomiting often ushers in pleurisy, pneumonia, cerebral affections, the eruptive fevers, &c.; it is also a very common symptom during the progress of dentition. Again, vomiting may be the result of spasm, such as happens in hooping-cough, the paroxysms of which are often terminated by sickness; or it may be due to gastric or intestinal disorder where the stomach is incapable of digesting the food put into it; in such a case the infant grows pale and languid, restless and irritable, he neither cares for the breast, nor for any other nourishment; he soon becomes anæmic, and the powers of the stomach are consequently enfeebled, a condition which is indicated by a craving for food, although vomiting often occurs as soon as it is taken; the breath is sour and sickly, and there are acid and offensive eructations, with constipation, owing to diminished peristaltic action of the intestines. When the indigestion continues for any length of time, the sickness is associated with all the evidences of impaired nutrition, and is quickly followed by general atrophy, which, unless it is relieved, very commonly ends in fatal exhaustion, in pulmonary phthisis, or in some other secondary disease.

The most prominent symptom of indigestion is vomiting; but as this may occur from a variety of causes, some of which have only indirect reference to the stomach, a few words may here be said as to the *Diagnosis*. The vomiting which is to usher in any of the eruptive fevers will be accompanied by symptoms common to those fevers. In the case of inflammation of some important organ, the lungs, pleura, &c., there will be much febrile and constitutional disturbance. In cerebral vomiting, such as arises in tubercular meningitis, the food is rejected almost as soon as swallowed. There will be fever, throbbing of the fontanelles, irregular pulse, retracted abdomen, possibly squint, and marked cerebral disturbance.

On the other hand, in the vomiting of dyspepsia, the food is retained for a while though causing much discomfort, and then is ejected in a curdled state, with some clear sour liquid; the abdomen is distended, sometimes tender; the bowels are confined, the motions being pale, hard, lumpy, and offensive; the tongue is coated, white or dirty-looking, with red papillæ; the fontanelles are usually depressed, and the pulsation is very feeble.

Treatment.—In simple dyspepsia, with debility and loss of appetite, attempts must be made to lessen the work of the stomach as well as to impart tone to this viscus and to the system generally. One of the first things to attend to in a case of this kind is the careful regulation of the diet. If the child be still sucking at the breast, it may be that the milk is too heavy for it, in which case the breast should be milked and the milk be diluted with water, or some asses' milk may be tried, or a change of nurse. The child should also be fed at regular intervals, and not more frequently than every two or three hours, except in those cases where the stomach has become so irritable that only a few teaspoonfuls can be borne, in which case it may be given every half hour, till gradually more is retained.

As medicines, the remedies on which we mostly rely are the citrate of bismuth and pepsine. Either may be given in one or two grain doses for a child from six months to a year old: the liquor bismuthi in five minim doses is a good form; as also the pepsine wine in ten to fifteen minim doses. If the vomiting be severe and the stomach seems to be very irritable, small doses of hydrocyanic acid, a quarter of a drop in almond mixture, or in the compound infusion of gentian or calumba, will be found useful, attention being at the same time paid to the quantity and quality of the food taken. Lastly, when the milk is returned curdled, when there is flatulence, and the vomiting gives pain, when there is stomach-ache with nauseous acid eructations, we may be sure that some acid different to the gastric juice is secreted: and this may be best neutralized by an alkali, potash, or magnesia, or lime water, with dilute hydrocyanic acid, while the tendency to its formation is checked by the use of the dilute mineral acids, in doses of one or two drops for a child a year old, with some mild bitter such as orange or gentian.

The constipation which often prevails in indigestion will be best treated by daily frictions of the abdomen with a mixture of equal proportions of soap liniment, tincture of aloes, and olive oil; or by giving a teaspoonful of the compound decoction of aloes every morning, or the same quantity of the decoction of taraxacum with a few drops of the tincture of jalap or the compound tincture of rhubarb; or, lastly, by the administration of pepsine, which, by securing digestion, improves the general nutrition, and thus restores a healthier action to the whole alimentary canal.

If the case be one in which the dyspepsia, if not due to, is at least accompanied by, disordered secretions, and especially by a free discharge of bile in the vomited matters, while the motions are pale and lumpy, one dose of calomel, a quarter or half a grain, will often check the vomiting and do infinite good in improving the state of the secretions. If the case has become rather chronic, and the child is a good deal reduced in flesh and strength, stimulants, especially brandy, in ten drop doses with the food, will be of great service: there is no medicine so efficacious as this in conditions of feeble vital power in children.

2. GASTRITIS.—Inflammation of the mucous coat of the stomach is not a frequent disease of children, but it may nevertheless occur even in children at the breast, and its symptoms are sometimes very obscure. Ordinarily, complaint is made of pain occurring in paroxysms and extending across the hypogastrium; there is vomiting—often incessant and excessive—of green and yellow fluids, and almost always immediately after food; constipation is of common occurrence, but occasionally there is diarrhœa—or the one may alternate with the other: a tympanitic and swollen state of abdomen, with heat and great tenderness over the epigastrium, are pretty constant phenomena: intense thirst, anorexia, a loaded and white tongue, with hot and dry skin, and a quick and small pulse, make up pretty well the remainder of the symptoms. Gastritis may be induced by improper food, and by swallowing acrid poisonous substances.

In regard to *Treatment*, we should be careful to allow only a very bland diet, with ice or cold water taken freely, giving frequent doses of the bicarbonate or chlorate of potash; purgative enemata should be administered, and warm fomentations or poultices applied to the epigastrium. Dr. Condie recommends one-sixth to one-half of a grain of calomel every one or two hours, when the disease is acute; a remedy which he says suspends very promptly the irritability of the stomach, and produces a favourable change in the symptoms generally. It may be mixed with a few grains of gum or sugar, and laid upon the tongue.

3. SOFTENING OF THE STOMACH.—In studying the morbid anatomy of diseases of the stomach, care must be taken not to mistake the alterations which this organ sometimes undergoes after death from the action of the gastric juice, with the changes of structure due to disease from natural causes, or arising from the use of deleterious agents. John Hunter first taught that the walls of the stomach may be dissolved or digested by the action of the gastric juice after death; and numerous observers have since verified the accuracy of this physiologist's deductions. It was Hunter's opinion, deduced from the observation of cases of accidental death, as well as from experiments on animals, that post-mortem digestion of the stomach was most commonly and most extensively found in persons who had died a violent death; though he remarks that "there are few dead bodies in which the stomach, at its great end, is not in some degree digested." Spallanzani, on repeating and varying Hunter's experiments, confirmed the general accuracy of his statements, while he also showed that a certain degree of heat is requisite to develop this solvent power of the gastric juice; and it now seems to be allowed that the more nearly we imitate the gastric temperature of warm-blooded animals—96° Fah. to 100° Fah.—the more rapidly and extensively will solution occur. At the present time, our knowledge of cadaveric softening of the stomach seems to amount to this: it is more frequent in infancy and early childhood than in adult age; it is most frequently found in hot weather, or

when the body has been kept in a warm room; the fundus, or that part to which the liquids in the stomach gravitate from the position of the body, is the most commonly affected; the softening or ulceration is sometimes confined to the mucous membrane, but frequently it extends through the whole of the coats; the excavated patches are of various extent, with thin, soft, irregular, and sometimes fringed edges, thus presenting a marked contrast with the swollen and often abrupt hardened borders of ulcers; the colour of the blood remaining in the vessels of the stomach is often darkened by the acid of the gastric fluid, giving rise to appearances resembling those produced by chronic inflammation; the softened tissues have an acid reaction, so that they putrify less readily than other parts, owing to the antiseptic virtues of the gastric juice; and lastly, this phenomenon occurs most frequently in cases of accidental sudden death, where food has been taken a short time previously, although it is very often found when death has arisen from disease of the stomach, from phthisis—especially in women—from inflammatory disease of the brain, from typhoid fever, or from disease of any of the abdominal viscera.

The important question which here presents itself for consideration is this:—Does softening of the stomach and intestines in the young ever occur during life from the action of inflammation, or as the result of any specific disease? It is impossible to answer this question positively, since opinions are so evenly balanced on the subject. Rokitansky admits two kinds of softening, one cadaveric, the other pathological; and it is to the latter that he refers softening of the stomach in children, conceiving that it depends upon some specific disease peculiar to early life. Cruveilhier, Billard, and others, seem to agree in the main with this opinion: Bouchut, West, and Elsässer do not allow the existence of this specific disease, but regard the softening so often found in the young as the consequence of changes occurring after death. Although our experience in this matter is but scanty, we may add that we have never met with any instance which would lead us to dissent from the views of these latter authorities. Dr. West justly says—"The much greater frequency of softening of the stomach and intestines in infancy and early childhood than in adult age, and the greater amount and wider extent of the alterations, have received considerable elucidation from the recent researches of Dr. Elsässer. He found that a much more rapid action upon animal tissues than that exerted by the gastric juice was put forth by any substance capable of undergoing the acetous fermentation, combined with pepsine. Such substances are furnished by the milk as well as by the various farinaceous and saccharine matters on which infants almost exclusively subsist. The tendency of these substances to undergo the acetous fermentation is checked by the presence of healthy gastric juice; while, as we know by experience, it takes place very readily in infants who are dyspeptic, and to a very remarkable degree in many cases of infantile diarrhœa. Facts bear out to a very great extent the opinion of M. Elsässer. Out of one hundred and four cases of softening of the stomach that came under the notice of two very eminent German physicians, MM. Herrich and Popp, seventy-two were met with in the period of infancy or early childhood." These views—which seem to bear the stamp of truth—will certainly not find less favour with our readers, because they are corroborative of the opinions originally brought forward by John Hunter.

IV. DISEASES OF THE INTESTINES.

1. DIARRHŒA.—Of all the complaints of infancy, relaxation of the bowels is probably the most frequent, though it may not appear so when tested merely by the death rate, for happily it is not a very fatal disease considering its frequency, provided only that it be carefully managed, and is not allowed to run on unchecked for any length of time. It is especially common between the ages of six months and two years—that is to say, during the process of dentition. To account for this, we have only to remember the rapid development of the alimentary canal which takes place during these months, the active evolution of the salivary and intestinal glands, and the sympathy which exists between the irritation in the gums and the intestines. Another factor in its production is atmospheric influence, the affection being most prevalent during the autumn months.

The *Causes* and hence the *Varieties* of diarrhœa occuring in childhood are so numerous that it is almost impossible to classify them ; the terms in frequent use, mild, simple, non-inflammatory, inflammatory, dysenteric, and the like, which are intended to describe different varieties of the affection, are alone sufficient to show the difficulty of classification. Probably the simplest, most obvious, and, at the same time, the truest distinction to be made between them pathologically is, into those which are and those which are not attended with inflammation ; such a division is useful, not only clinically, but therapeutically also.

It is, however, more than doubtful whether any good can accrue from a mere enumeration of the causes of diarrhœa, for their name is almost legion, and, except so far as such causes may affect the treatment, nothing will be gained by their consideration here : allusion will, therefore, be made to them under the head of

Symptoms.—Disorder of the bowels varies in degree, extent, and results in every conceivable way. Frequently the looseness is beneficial, and ceases naturally in a day or two. But very slight causes suffice to make it pass the limit of health, and this is especially the case in regard to unsuitable food. Moreover, it is clear that certain atmospheric influences exercise a prejudicial effect, and tend directly to increase the diarrhœa which is set up by other causes:

thus a relaxed condition of the bowels, which would give us no uneasiness in the winter months, may be very troublesome in the summer or autumn.

Non-inflammatory diarrhœa often comes on in a healthy child with an attack of vomiting, the contents of the stomach being first expelled; afterwards a greenish-coloured mucus is thrown up. The attack of sickness is quickly followed by relaxation of the bowels; the evacuations at the commencement consisting of healthy fæces, then of loose copious bright-yellow stools. If this looseness continues, the motions assume a green spinach-like appearance, similar to those produced by the administration of mercury; very frequently they contain numerous white specks, consisting of the casein of undigested milk. The general symptoms vary, commonly they are but slight; there may be a certain amount of uneasiness and pain, flatulence, pallor of the face, and a feeling of depression or languor, followed by more or less colicky pains, restlessness before each motion, violent crying for a long time, flexing of the thighs on the abdomen, a constant desire to defecate, and refusal of all food. According to the intensity of the disease, the abdomen becomes distended. Defecation is accompanied with a discharge of gases, and is attended with noise as the motions are expelled from the intestine. If a tooth is being cut, the general feverishness is increased, the appetite is impaired, and there is troublesome thirst: while, if the diarrhœa persists, it is very likely at this time to lead to extreme exhaustion.

The symptoms usually cease spontaneously, or they readily do so under the influence of medicine. The sickness stops, the action of the bowels becomes less frequent, the fæces get less watery and resume their natural appearance, and in four or five days the patient is well.

Treatment.—An infant not weaned ought to be taken from the breast for twelve hours or so, until the irritability of the stomach ceases; a few teaspoonfuls of plain water or of barley water being given frequently to quench the thirst. In an older child, all solid food is to be forbidden, and thin arrowroot made with milk and water substituted, or better still, some ground rice boiled with milk may be given. If the attack be due to improper food, a small dose of castor oil or of rhubarb should be given, to expel any irritating matters that may be left in the intestines; after the action of which, a few doses of aromatic chalk powder, or of logwood and catechu—F. 65, 69—will suffice to complete the cure. When the diarrhœa has become obstinate, roasted acorns served up as coffee have been successfully given. Children readily drink this coffee. Salicine has been highly recommended, in doses of one half-grain every four hours, to a child under two years of age. Gübler advises oxide of zinc combined with bicarbonate of soda. As the best substitute for the mother's milk, Monti gives veal broth with cow's milk, Liebig's or Nestle's food, or condensed milk. He finds it advantageous to give fluid food only, and to avoid an amylaceous diet.

In the diarrhœa connected with dentition rather more caution should be used. If the gum be a good deal swollen, tender, and evidently causing much distress, it may be lanced, though we cannot confess to having ever seen any good results follow from this practice. A tepid bath should be used if there be much fever; and a saline draught, containing an excess of alkali, with a little ipecacuanha and opium (Dover's powder), may be given every three or four hours, with great advantage; one grain of Dover's powder, with the same quantity of mercury and chalk, given at bedtime, will often relieve restlessness. Care should be taken to check the looseness by some astringent, either with or without a sedative—F. 66, 68—unless it ceases under the above treatment: at the same time we must be on our guard not to allow the little patient to get too much depressed.

We invariably insist on the immediate application of a flannel belt to the abdomen, to be worn night and day. As cold is a potent cause of diarrhœa, this simple remedy, combined with a careful diet, often summarily checks an attack. If the evacuations smell sour, Vogel recommends that carbonate of soda be added to the milk diet (ʒj. ad fl. ℥vi).

It cannot be too strongly insisted upon that a large proportion of the cases of diarrhœa in children require nothing but careful management in diet, clothing, and general hygiene, and it is important whenever we can to avoid giving any medicines. When symptons of exhaustion are apparent we must administer stimulants with an unsparing hand, being guided solely by the effects produced: brandy or port wine, with arrowroot, or boiled ground rice, will generally produce a decidedly good result.

2. Inflammatory Diarrhœa, or Dysentery.—Though much more serious than the preceding, yet this disease is in many respects closely allied to it; they both often prevail at the same time, are to a considerable extent dependent upon the same causes and amenable to the same remedies; moreover, the one often seems to result from simple neglect in the management of the other. At the same time it must be admitted that the two affections differ in some important particulars: for in fatal cases of the non-inflammatory variety no morbid appearances of any note are to be found after death, whereas in dysentery, characteristic and well-marked changes are generally to be observed in the intestinal tract.

Symptoms.—The disease may either arise idiopathically, or be developed out of simple diarrhœa. It sets in usually with urgent vomiting, quickly followed by violent relaxation of the bowels; so that there may be thirty or more evacuations in the course of twenty-four hours. The stools are at first natural in appearance, but soon become slimy and streaked with blood; they are forcibly expelled, and their expulsion is followed by tenesmus. At the end of a few hours the mucous evacuations become more scanty; they are perhaps mixed with separate small lumps of fæces—scybala—which pass with pain and difficulty; and they either continue streaked with blood, or frequently a few drops of blood—perhaps even one or two teaspoonfuls—follow their passage. These scanty evacuations produce distress rather than relief; the patient is constantly tormented with tenesmus and griping; the stools become fœtid, dark-coloured, and mixed with shreds of lymph; and the bladder sympathizes with the rectum, giving rise either to strangury or to frequent micturition with high-coloured scalding urine. On examination, a characteristic erythema—absent in slight spasmodic diarrhœa—will be noticed about the anal region. Under these circumstances, it cannot be wondered at that the constitutional symptoms are very severe. There is more or less fever; the child is drowsy, but very irritable when roused; he soon becomes weak, and loses flesh so rapidly that in twenty-four hours a previously healthy looking infant has sunken eyes, sharp features, and shrivelled limbs; the tongue is furred, and the papillæ prominent; pulse quick and small; skin harsh, hot, and dry; thirst urgent; no appetite; dyspnœa; and great prostration.

At the end of forty-eight hours the symptoms abate in severity; the sickness ceases, the bowels act less frequently, but the tenesmus continues and produces prolapsus ani, while the thirst remains and there is a constant desire for cold water. If the disease does not now yield to treatment, its further course will be uncertain and fluctuating. Sometimes the case becomes chronic and terminates in death after two or three weeks, or bronchitis may supervene, or signs of cerebral irritation are manifested. In quickly fatal cases, the abdomen becomes tense, full, and tender, especially on pressure; the pulse gets weaker; the tongue is dry, red, glazed, and aphthous; the evacuations are extremely offensive and watery; hiccup comes on, with great exhaustion and emaciation; and death soon follows.

Causes.—Improper and insufficient food; deficient clothing; cold, close, damp, ill-ventilated dwellings; and defective sewerage, are fertile causes of dysentery. Very frequently it is associated with some malarial poison; and hence it is frequently endemic in certain localities. It may also prevail as an epidemic; thus in an epidemic of dysentery which prevailed in Dublin, an account of which was given by Dr. Mayne in the *Dublin Quarterly Journal of Medical Science*, p. 294, vol. vii. 1849, 1.222 of the poor inhabitants of the South Dublin Union Workhouse were attacked between April, 1846, and August, 1848; of which number 127 were male children under ten years of age, and 74 of these died.

Pathology.—Dysentery consists chiefly in inflammation followed by ulceration of the mucous membrane of the colon, especially, perhaps, of the lower part of this gut and the rectum; hence it has been sometimes defined as colitis. Cases, however, are occasionally seen in which the morbid action does not stop at the ilio-cæcal valve, but extends for many inches up the small intestines.

Morbid Anatomy.—The morbid appearances found after death do not always correspond with the severity of the symptoms during life; for the former are sometimes comparatively slight, when the disease has been very severe. The results of the morbid action are chiefly found in the large intestine: they are less marked than in the fatal dysentery of adults. In all cases, however, there are evidences of inflammation in the colon, the mucous membrane being red, swollen, and oftened softened, covered with numberless dark specks, consisting of the enlarged orifices of the solitary glands, and frequently having the glands themselves enlarged, and projecting like millet-seeds above the level of the surrounding tissue. If the inflammation has gone on to ulceration, numerous cup-like depressions or ulcers are found, the base of the ulcer being formed of the muscular coat of the intestine; while the mucous membrane on the prominent surfaces of the intestinal rugæ is also destroyed, particularly in the sigmoid flexure of the colon and in the rectum. If the ileum has been involved, the mucous membrane of the inflamed portion—especially that part near the ilio-cæcal valve—will be found vascular and thickened, and having a velvety look. Occasionally Peyer's glands are affected. The mesenteric glands are usually healthy, or only very slightly enlarged, and, perhaps, reddened.

In the paper to which reference has already been made, Dr. Mayne states that, in the majority of those who died within three weeks from the commencement of the disorder, the large intestine was found the principal seat of the organic mischief, and in the majority of such cases it was the only part involved. The morbid appearances generally extend from one end to the other of this portion of the intestinal tract, the lower parts of the canal being the most intensely affected. There was also an undue degree of vascularity of the peritoneum covering the diseased portions of the canal: the absorbent glands along the same part were congested and enlarged; the walls of the intestine were thickened and indurated; while its mucous membrane varied in colour from a bright red to green or purple, and was in some cases covered with a bran-like exudation, in others ulcerated. The ulcers were sometimes small and isolated, in others superficial and extensive, and in a third variety large, irregular, ragged, and penetrating. The small intestines were generally healthy; and the liver was sometimes much congested.

Treatment.—When the disease sets in violently with considerable tenderness of the abdomen, great relief will be experienced from placing the child in a hot bath, to the water of which a decoction of poppy-capsules has been added: the abdomen should be afterwards well fomented, or covered with a hot linseed-meal poultice, or with a large bran poultice. If the stomach be not too irritable to allow of the administration of medicine, a small quantity of castor oil and tincture of opium in mucilage—F. 230—should be given: and when the symptoms are relieved after two or three doses, an opiate enema may be advantageously administered—F. 126—to quiet the tenesmus and irritability of the bowel. Where the vomiting will not allow any medicine to be retained, a quarter of a grain of calomel with the tenth of a grain of opium, to a child seven years old, may be laid upon the tongue every three or four hours: at the same time the child may be allowed to drink freely of cold water, while its diet is restricted to milk and water, or even to barley-water. In such cases it is sometimes advantageous to wash out the rectum with warm water, and then to inject an opiate enema. We have never employed the enema of nitrate of silver—gr. 1 to distilled water fl. oz. 1—so strongly recommended by M. Trousseau; but it is a remedy which ought certainly to be tried in cases where the diarrhœa is intractable. In some epidemics no medicine seems so useful as mercury when given early, in small doses rather than large ones, and continued until the evacuations exhibit a beneficial change, or until salivation occurs. This treatment has been strongly recommended by Dr. Mayne; next to mercury he found alkaline medicines were most beneficial; the liquor potassæ, or lime water, with a small quantity of opium, were found very soothing. Opium in full doses aggravated the disease; purgatives were very rarely useful; the bitartrate of potash in large doses failed; turpentine was of little use, except in cases of relapse; and ipecacuanha was in his hands perfectly ineffectual. Amelung begins his treatment with castor oil, if hard fæcal masses can be felt through the abdominal walls or found in the stools. Then he prescribes, for adults, a half per cent. solution of carbolic acid as follows:—Carbolic acid 15 grains: rectified spirits of wine, 15 minims; tincture of opium, 15 to 20 minims; mucilage and poppy syrup, of each 6 drachms; distilled water to 3 ounces; a tablespoonful to be taken every two hours. To children he gives smaller doses according to age. Rademacher has obtained signal results from the internal exhibition of large doses of nitrate of soda, given in a warm solution.

In regard to ipecacuanha, however, it seems likely that the conflicting opinions which are entertained by different practitioners may be accounted for by the dose administered, as nothing but the most minute quantities are found to answer in these cases, and our own experience is strongly in favour of it. The idea that ipecacuanha is a depressant and nothing more is contrary to the clearest evidence of its value in this disease.

In the majority of cases stimulants will be needed, but judgment is requisite as to the time when they should be commenced. The practitioner should watch every case of dysentery narrowly, visiting his patient at least every eight hours; for symptoms of great exhaustion often come on very rapidly, and due support must then be afforded. The stimulant we recommend to commence with is port wine, made into warm, sweet, slightly spiced negus: when the depression is accompanied with irritability of the nervous system—which we must be careful not to mistake for cerebral inflammation—a drop of Battley's liquor opii may be added to the wine and water at intervals of three or four hours, according to the patient's age and condition. Should symptoms of extreme debility supervene, brandy—in half-drachm or drachm doses, mixed with milk or arrowroot—is to be administered; the dose being repeated every two or three hours, or even every hour, and increased if necessary, according to the degree of prostration, and the age of the patient; the above is for a child two years old. We have also found the mistura spiritûs vini gallici of the Pharmacopœia very useful in these cases of extreme prostration.

When the inflammation is declining, and the looseness of the bowels seems about to degenerate into chronic diarrhœa, aromatic astringents, or gallic acid and cinnamon, or the perchloride of iron—F. 65, 68—are very valuable. Now also fluid, nourishing food—such as strong broths free from salt, beef-tea and isinglass, milk, and arrowroot—may be allowed: but great care must be taken to prevent the use of solids, inasmuch as relapses are very apt to occur, and are especially induced by anything which irritates the ulcerated intestinal mucous membrane. Through the whole progress of the case the practitioner must insist that the patient be kept dry and clean; oxide of zinc, or zinc ointment, should be applied to the groins and folds of the buttocks after each ablution, especially if there be any tendency to excoriation, a forerunner of an attack of intertrigo. Careless nurses often merely dry the infant's soiled napkins without having them properly washed after they have been once used: such an injurious proceeding must not be tolerated.

As the disease subsides, tonics, good diet, the use of the tan bath —F. 77—and change of air, will aid in quickly restoring flesh and strength. It not unfrequently happens, however, that convalescence is retarded, and the debility kept up, by the child's disgust for food. Fortunately we have two or three remedies, to one or other of which we may resort with every prospect of overcoming this difficulty. Pepsine will be valuable in those instances where the loss of appetite appears to be due to the insufficient secretion of gastric juice; it may be given in doses of two to four grains with the two or three chief meals of the day. Professor Weisse, of St. Petersburgh, in the *Journal für Kinderkrankheiten,* vol. iv. p. 99, Berlin, 1845, first recommended the use of raw meat in the diarrhœa which often occurs during weaning: and many German physicians speak highly of its effects. About two tablespoonfuls of finely-chopped beef or mutton may be given daily to a child one year old; if it craves for more, and evidence is afforded of its digestion being good, the quantity may be increased. It is very remarkable that debilitated children who refuse all other kinds of food will eagerly take this; but as the strength is regained, the desire for it passes away. There is, however, one objection to this remedy, and it is rather a serious one—viz., the liability which there is to the development of tapeworm, from its germs being taken in the form of cysticercus. But it is only in severe cases that this food would be recommended, and then great care should be taken to procure the very best and healthiest of meat. The third remedy to which we may have recourse is prepared bullock's blood, which has, however, failed in our hands completely. This failure may have been owing to the way in which it was prepared, for in its dried state it seemed to resemble charcoal. It possesses the advantage over raw meat of not containing the cysticercus cellulosæ; which, as we have just said, when introduced into the human intestines, probably undergoes its higher metamorphosis into the tape worm. Sometimes prolapsus of the anus supervenes. The attendant should be taught to manage this complication somewhat in the manner laid down further on.

3. CONSTIPATION.—This is frequently a symptom of many different diseases, rather than an affection *per se*. Sometimes, however, the most careful examination fails to detect any distinct malady, with the exception of a sluggishness of the bowels; which often induces flatulence, colic, a furred tongue, general restlessness, and loss of appetite.

Monti considers that it is due to defective development of the muscular tissue of the intestines, and to the peculiar form of nourishment at this period. He enumerates the following causes:—1. Mechanical impediment, as in congenital deformity, imperforate anus, invagination, hernia, &c. 2. Defective nourishment, as from congenital defects of the lip and throat, scanty secretion of milk, &c. 3. Faulty nourishment, as from excess of casein or defect of fatty matters in the milk, bringing up by hand, starchy food, &c. 4. Deficiency or diminution of the peristaltic movements of the intestines, atrophy, &c. 5. Diminution of the intestinal secretion, as in long-continued diseases in consequence of anæmia. It is, further, a symptom of diseases of the brain and spinal cord; a consequence of deficiency of drinks, of the use of astringents, of the presence of ascarides, fruitstones, &c.; in older children it is often due to a deficiency of bodily exercise.

Treatment.—This condition may at least be temporarily removed by gentle laxatives, such as manna, syrup of violets, magnesia, castor oil, &c.; where the constipation seems to be due to the difficulty of passing hardened fæces, the employment of inspissated oxbile will do good.

Pepsine is another very useful remedy; it may be given to the youngest children in doses of one to three grains dissolved in milk twice daily. It seems to relieve constipation in the same way that it checks some forms of diarrhœa, by enabling the stomach to do its work more thoroughly. Another remedy which we have found of very great service in the constipation of children is belladonna; what its exact *modus operandi* may be we do not know. It seems likely that some forms of constipation may be due to a kind of spastic action of the muscular coat of the bowel, and that by calming this, which belladonna appears to do, regular peristalsis results. We have seen, in the same way probably, that opium, in very minute doses, will sometimes act as a purgative. In other cases again, the introduction up the bowel every morning, or as often as may be necessary, of a small piece of soap in the form of a suppository, answers very well.

In our opinion the constant employment of enemas, which we have often heard recommended, is a practice very much to be deprecated. We believe that it weakens the muscular tone of the bowel, and so tends to perpetuate that against which it is used.

4. MECHANICAL CONSTIPATION.—By this term we mean that form of constipation which is induced by some mechanical obstacle, such as the *strangulation of an external hernia*, the *invagination of a portion of intestine*, or some *congenital malformation of the bowel*.

With regard to the *first*—it need only be mentioned that although infants and young children not infrequently suffer from hernial protrusions, yet it very rarely happens that the intestine becomes strangulated. The mere fact, however, that such an occurrence may take place, even in an infant only a few days old, renders it necessary in every case of obstinate constipation, with vomiting, pain, &c., that the practitioner should early and carefully examine the umbilicus and the inguinal regions in order to satisfy himself that there is no strangulated hernia. If he discovers one, and the taxis —with or without chloroform—fails to reduce it, an operation must be promptly performed to relieve the strictured gut.

The *second* cause of mechanical constipation—viz., invagination of a portion of the intestine—is not uncommon in the young. It is occasionally found in the bodies of infants who have died from diseases unconnected with any intestinal affection; and in such the invagination or intussusception, as it is called, probably occurs during the act of dying, under the influence of the peristaltic movements of the intestine induced by extreme suffering. A single intussusception may exist or there may be several: the small intestines are alone affected, and in by far the greater number of cases it is the ileum.

When intussusception occurs during life as an idiopathic disease, it is generally in infants under one year of age: though why it should be so it is not easy to explain. A portion of the intestine slips or is drawn down into the continuous inferior part—just as the finger of a glove is drawn back on itself; and the inflammation and swelling which arise increase or complete the obstruction. In the course of a few hours this state is made manifest by certain well-marked and important symptoms, such as vomiting, constipation, tenesmus, and severe attacks of colic, as indicated by loud and violent cries. In some fortunate instances these indications of invagination cease, the child has a natural motion and gets well: and it is not improbable that Nature has reduced the intussusception and effected a cure. Cases are also related in which the invaginated portion has sloughed off, and been discharged in the stools; this mode of cure is however very uncommon in the young. In other cases the affection continues; then we find that the child's strength rapidly fails, the pulse becomes very feeble, the countenance anxious, and the extremities cold. Sometimes, indeed generally, there is vomiting of fæcal matters; tenesmus with a discharge of bloody mucus often sets in; and tumefaction of the abdomen, with, perhaps, the formation of a distinct elongated tumour over the seat of the intussusception, may occasionally be detected. Death occurs either from exhaustion, or from the supervention of convulsions.

Lastly, cases of congenital malformation of the bowel occur now and then, and may give rise to very serious consequences. These however, we shall consider in the chapter relating to congenital deformities. There cannot usually be much difficulty in the diagnosis of a congenital defect, and but little either in the treatment necessary: the only debatable point in cases fitted for operation is as to where the bowel may most readily be reached, so that if successful the child's future comfort may be best promoted.

In the *Treatment* of mechanical constipation we of course first resort to the use of purgatives, and purgative enemata. As soon as we are convinced, however, that there is some mechanical obstruction, our plan must be altered; for under such circumstances aperient medicines are mischievous. Opium is then our sheet-anchor; but it must be given with all the caution which the use of this drug demands in the young. At the same time we should gently throw up as far as we can large quantities of warm water by means of an elastic catheter fitted to a syringe; if there be no great amount of tympanitis, we may try the injection of air. Supposing these means fail, we have then to determine whether any surgical operation is justifiable? Without absolutely recommending such a proceeding, an exploratory incision into the abdomen would appear to us to be perfectly justifiable in any apparently hopeless case. The misfortune is, however, that if the intussusception has existed many days, it is not improbable that the peritoneal surfaces of the gut, which have been brought into such close contact, may have formed firm adhesions; hence the danger of the operation would be further increased by the necessity for breaking down these adhesions. It must also be remembered that gangrene sometimes results from intestinal invagination; and any operation would under these circumstances be worse than useless.

5. Intestinal Worms.—There are five varieties of worms which are occasionally found inhabiting the intestinal canal in the human subject; three of these possess an alimentary tube, and are therefore called hollow worms, or *Cœlelmintha*—κοῖλος, hollow, and ἕλμινς, a worm, and belong to the natural order Nematoda; and two which have no abdominal cavity, and are hence termed solid

worms, or *Sterelmintha*—*στερεὸς*, solid, and ἕλμινς, being of the natural order Cestoda.

In the first class we have,—

a. The Tricocephalus Dispar, or long thread-worm, usually found in the cæcum and large intestine: it measures about two inches in length, and has a very slender body. They are often found in considerable numbers, even in the intestines of healthy persons, but are much more commonly met with after continued fever: during life they give rise to no symptoms which are at all recognizable as characteristic.

b. The Ascaris Lumbricöides, or large round-worm, is found in the small intestine, especially of ill-fed children, between the ages of three and ten. Occasionally it finds its way up into the stomach, and we have known it make its way out by the mouth. It somewhat resembles in size and shape the common earth-worm, and varies in length from six to nine inches, being of a light-yellow colour. The symptoms which it or they, for they are seldom alone, may possibly give rise to, are—thirst, disturbed sleep with grinding of the teeth, pallid countenance, dilated pupils, bluish rings beneath the eyelids, fœtid breath, swelled belly, emaciated extremities, depraved appetite, slimy stools, itching of the nose, tenesmus, and itching of the anus.

The Ascaris Vermicularis, or *Oxyuris*, is the small thread-worm which is usually found in the rectum and sigmoid flexure, often in considerable numbers; it is the smallest of the intestinal worms, its average length being about a quarter of an inch. The symptoms to which it gives rise are, intolerable itching and irritation about the anus, tenesmus, depraved appetite, picking of the nose, offensive breath, disturbed sleep, and general restlessness.

In the second class we find,—

a. The Tænia Solium, or common tape-worm of this country, which exists in the small intestine in children usually from three years old and upwards, varies in length from five to ten, twenty, or even thirty feet, and in breadth from one line—at its narrowest part—to four or five at its central or broadest portion. The head of this parasite is small and flattened, having in its centre a projecting papilla armed with a double circle of hooks, around which are four suckers or mouths, by which nourishment is imbibed; the generative apparatus consists of a ramified canal or ovarium containing the ova, and occupying the centre of each joint. This worm is usually met with alone. The symptoms of its presence are not very striking, its existence being generally unsuspected until joints are passed in the stools; in many cases, however, there is a continued craving for food, debility, pain in the stomach, emaciation, and itching about the nose and anus.

b. The Bothriocephalus Latus, or broad tape-worm, is the largest of these parasites which infect the system, often measuring upwards of five-and-twenty feet in length by about an inch in breadth, and having as many as three to four thousand joints; it is almost peculiar to the inhabitants of Switzerland, Russia, and Poland. It differs from the common tape worm in having its segments of a greater breadth than length. The extreme fertility of the *Bothriocephalus latus* may be understood by considering that one foot of the well-developed worm contains 150 segments or joints; each joint possessing its own ovary and male organs, and being therefore fertile; and as each ovary would produce 8,000 ova, it may be calculated that ten feet of such a worm would produce the enormous number of 12,000,000. They are very rarely met with in this country, but they are occasionally. Professor Owen, examining the collection of a worm doctor in Long Acre, found three specimens; two had come from persons who had been in Switzerland, but of the third nothing was known.

If for the sake of convenience we tabulate these entozoa, according to the parts they inhabit, we shall have,—

In the small intestine . . .	Ascaris lumbricöides, or round-worm.
	Tænia solium, or common tape-worm.
	Bothriocephalus latus, or broad tape-worm.
In the large intestine we have .	Tricocephalus dispar, or long thread-worm.
	Ascaris vermicularis, or common thread-worm.

It is not very well understood how these parasites find admittance into the human body; some have thought that it might be through drinking impure water, and it seems more than probable that with regard to the *Ascaris lumbricöides* such is its origin. Of late years some very curious and interesting facts with regard to the origin and development of the *Tænia solium* have been brought out. It appears that the ova of the tænia, when eaten by an herbivorous animal, develop into the *Cysticercus cellulosæ*, and these again in their turn into the *Tænia solium*.

Robinski has called attention to a *Spurious Intestinal Worm*. It is found both in children and adults, and invariably in debilitated constitutions. It is of the form of a small spindle-shaped cylinder with a pedicle-like stalk, resembling the husk of a cereal. On examination the pseudo-worm will be found to consist of a spindle-shaped tube, from the spongy substance immediately beneath the rind of the orange.

The *Symptoms* to which the presence of these different varieties of parasites severally give rise in the human subject, are by no means uniform. Many of them are very obscure. Some are well marked and highly characteristic, while, on the other hand, some scarcely give rise to any symptoms, and are not recognizable till after their expulsion.

Practically the symptoms are divisible into the local and the remote. The former have reference chiefly to the habitat of the animal. The latter, to the effects produced sympathetically, or by reflex action. Hence derangements of the *primâ viæ*, principally in the form of intermitting diarrhœa, the ejected matters being offensive and liquid from the presence of a good deal of slimy mucus: it is in these evacuations that the entozoa are expelled, and their removal is the direct result of the irritation which they create. Besides the diarrhœa, there is often vomiting. The symptoms which are associated with this condition are a slightly coated tongue, with remarkably distinct and fungiform papillæ. The skin is of a greyish muddy colour, dark under the eyelids, the pupils often widely dilated, the body swollen and hard, appetite capricious, at times ravenous, at others very indifferent; the child is restless, irritable, and fretful, especially at night, when he groans and gnashes his teeth, frequently picks his nose, and often has intense itching about the orifice of the bowels with occasional tenesmus; sometimes there is a short sharp irritative or spasmodic cough; attacks of hiccough are not infrequent, and in children of a highly nervous temperament convulsions may ensue.

With all this, and in consequence chiefly of the derangement of the digestive organs, the child loses flesh, he gets weak, and has the appearance of being thoroughly out of health: although as soon as he is rid of the parasite he very quickly regains his health and strength; there are probably few conditions in which the result of judicious treatment is so soon apparent.

Passing now from these general symptoms, there remain for consideration some which, if not peculiar to, are at least associated with, peculiar kinds of worms. For instance, the *Ascaris vermicularis* or *oxyuris*, which is the most common of all intestinal parasites, gives rise to very urgent and troublesome local symptoms in the shape of tenesmus, most aggravating itching about the anal orifice and adjacent parts, and a state of great restlessness, irritability, and fretfulness. Diarrhœa is also more frequent with this than with any other variety, and incontinence of urine often occurs, especially at night. Sometimes a vaginal discharge is set up either from the adjacent irritation, or, as sometimes happens, from the migration of the worms from the bowel to the vagina.

With the *Ascaris lumbricöides* a state of chronic diarrhœa is perhaps the most constant symptom, the motions being extremely offensive, slimy, often pale in colour, and passed with much straining. The nervous phenomena are usually more severe in this than in other varieties, and hence convulsions are apt to occur. Febrile disturbance, especially in the evening and night, is of common occurrence.

Various symptoms are attributed to the presence of the *Tænia*, but though sometimes symptoms of apparent severity occur, they are neither uniform nor distinctive, and the diagnosis will generally be less certain in this than in any other kind. There are no marked intestinal symptoms, no diarrhœa or vomiting, and no tenesmus; but complaint is often made of abdominal pains, dull and aching or sharp and colicky, and chiefly about the region of the umbilicus. There is also sometimes great emaciation and a ravenous appetite, these symptoms being more marked and uniform in this than in any of the other varieties.

Treatment.—The treatment of *Worms* requires attention to two points—first, the expulsion of the parasites from the intestinal canal; and secondly, the improvement of the general health and the restoration of the bowel to its normal condition, without which the expulsion of the worms will avail but little. The *Ascarides* may generally be killed and expelled by enemata of infusion of quassia, ¼ to ½ pint, or of common salt, ¼ oz. to ¼ pint of water, or lime-water, ¼ to ½ pint, or of the tincture of the sesquichloride of iron, in the proportion of 2 drachms to half an ounce in a quarter or half a pint of water. The compound scammony and jalap powder is also a most successful remedy when given by the mouth in the early morning, and if followed by one of the enemas in the evening it is pretty sure to answer well.—Vide Formulæ; *Anthelmintics.*

We have several remedies for the expulsion of the round and tape-worms; such as—the oil of turpentine, scammony and jalap, carbolic acid, compound jalap-powder with calomel, the bark of the pomegranate root, cowhage, the kousso, and the oil of male fern. For *tape-worm* we generally trust to the latter, which we thus administer:—On the first morning we commence with a dose of castor-oil or a Seidlitz powder, and during the day the patient is kept on very low diet. At night the purgative is repeated; and thus the worm or worms are thoroughly uncovered by the removal of the contents of the alimentary canal; they therefore receive the full benefit of the—to them poisonous—dose of the oil of male fern, which is taken the first thing on the following morning, according to F. 44. By this means, perhaps twice repeated, we shall seldom fail to remove the whole worm, including the head. Another remedy which we have found very successful for the *lumbrici* is santonine, given in the form of powder, two or three times a day, in doses of 3 grains to a child five years old. It usually acts as a diuretic, and frequently affects the child's sight, but this only lasts for a day or two and then passes off. To prevent their return, tonics should be given; and especially the mineral acids in infusion of quassia, or the tincture of sesquichloride of iron with tincture of aloes, &c. The patient should also be directed to take plenty of salt with the food; and to avoid pork and all imperfectly-cooked meats.

It need hardly be mentioned that none of these remedies ought to be resorted to unless we are quite certain that the child is affected with some verminous affection. The general symptoms are in all cases untrustworthy, since none of them are peculiar to helminthiasis; moreover, when worms are present in the intestinal canal, distinct evidence can almost always be obtained by examining the evacuations, inasmuch as portions of them are most likely to pass away.

In regard to the second part of the treatment, this consists mainly in the exhibition of an occasional aperient, once or twice a week, to remove all unhealthy secretions, and for this purpose there is nothing better than castor-oil, or rhubarb and magnesia, or aloes. In addition to this, the nitro-muriatic acid, with some bitter infusion, will be of great service in restoring tone to the alimentary canal, and checking the secretion of mucus which is so favourable to the propagation of the parasites. Iron and cod liver oil will do great good not only in promoting a return to health, but probably also in preventing a recurrence of the evil. We may add that we have never met with a verminous affection in an infant confined to the breast: although it is said that worms have been found even in the intestines of the fœtus.

6. Prolapsus Ani—not unfrequently occurs as a consequence of the tenesmus in inflammatory diarrhœa, or from the abuse of purgative drugs, or it may follow from the straining requisite to pass hardened fæces after prolonged constipation, or it may result from the forcing which occasionally attends the presence of worms, and in this latter case it usually ceases so soon as the worms are expelled; indeed, generally, as the cause of the protrusion is removed, the affection ceases; but such is not always the case. Hence the practitioner should be prepared to recommend appropriate remedies for its cure. Perhaps the best plan is to insist that the little patients shall pass their evacuations while lying on the back, as in this position the bowel rarely descends, and it is impossible for much straining to be exerted. The nurse may also be directed to support the margin of the anus with her fingers, during defæcation; provided the child is not old enough to do so for himself. If, notwithstanding these precautions, the rectum or its mucous membrane still prolapse, the nurse should be taught to return it gently by gradual compression of the protruded gut into the form of a cone, while pressure upwards is exerted till the mass recedes. If necessary, a bandage and compress may afterwards be applied to keep the parts in their normal position. In all cases treatment must be adopted to impart tone to the relaxed tissues by the use of astringent injections; such as, infusions of oak bark or of rhatany, or solutions of alum or of sulphate of iron—gr. 2–6 in water oz. 1. These may be repeated once or twice a day, and great care must also be taken to prevent constipation and consequent straining. Should astringent injections fail, Monti advises the local application of the solid nitrate of silver in radiating lines along the axis of the intestine. If the prolapse has lasted long and the sphincter ani is paralyzed, he employs the actual cautery at the line where the mucous

membrane covers the common sphincter. In regard to general treatment, ferruginous tonics, quinine, or the mineral acids may be administered internally; and the regular action of the bowels should be insured by the frequent use of mild unirritating laxatives, or by the occasional exhibition of a good dose of calomel and rhubarb, as advised by Sir Benjamin Brodie. If all these means fail to effect a cure, it may be necessary to resort to surgical treatment, and in that case probably the best method will be the removal of some of the loose folds of skin round the margin of the anus, or the application of the actual cautery to the same in order to secure contraction of the anal orifice.

V. PERITONITIS.

Peritonitis in children, as in adults, occurs in two distinct varieties or forms, due to essential differences in the nature of the disease: we have the *acute*, which is also called the *idiopathic* variety; and the *chronic*, which either results from the former, or is the consequence of a distinct constitutional taint, the tubercular cachexia, giving rise to *chronic tubercular peritonitis*.

A. *Acute Peritonitis*, or acute inflammation of the peritoneum, is not a very common idiopathic affection at any period of life, and fortunately it is extremely rare during childhood. There seems to be abundant evidence, however, that it occasionally happens during intra-uterine life; in which case it is probably due to some syphilitic taint. When it occurs it may cause the death of the fœtus; or the infant may be born still suffering from the disease, and with other unmistakable evidence of syphilis.

There are some facts, however, which seem to prove that acute peritonitis may occur idiopathically, and even in a more or less epidemic form among children, especially those under a year old. In such cases the disease is often associated with other zymotic affections. It runs a peculiarly rapid course, and is usually very fatal; it seems as if the poison, or whatever else it may be, had a special tendency to affect the serous membranes, just as other influences attack the mucous surfaces, for in some cases pleurisy is associated with the peritonitis in the same child, or the two diseases occur side by side as it were in different children. Now and then, acute peritonitis occurs as a sequela of other diseases, especially scarlatina, the sequelæ of measles attacking the mucous surfaces; it occurs also after other febrile diseases.

Symptoms.—When idiopathic peritoneal inflammation is set up in a child, the symptoms are much the same as those which are developed in the adult; but when the peritonitis is the secondary disease, then the diagnosis is more difficult, inasmuch as the symptoms are often obscure in the commencement and are generally masked by the primary affection. The earliest and most prominent indication of peritonitis in both instances, is the severe suffering which is produced; the pain being at first confined to a particular part but afterwards extending over the whole abdomen, and being accompanied by great fever and constitutional disturbance. Moreover, the pain is aggravated by any movement which calls the abdominal muscles into action, or by pressure—even the weight of the bedclothes being sometimes almost insupportable: the little patient consequently lies quiet on his back, with his knees bent, and the legs drawn up. The abdomen is almost tense, the skin burning hot, and there is frequently tympanitis; the bowels are constipated; there is sometimes, but not very often, nausea and vomiting; the skin is hot and dry; the pulse, small, rapid, and weak; the tongue furred; and the countenance is expressive of suffering and great anxiety. The character of the breathing is almost pathognomonic. As every inspiration produces pain in the hypochondria, it is shallow, frequent, and thoracic, and consists of a long expiration, followed by a number of short inspirations, and generally each expiration is accompanied by a cry of the same duration. Lastly, this symptom is usually associated with drawing up of the limb. After a time the belly ceases to be tympanitic, but remains somewhat enlarged from the effusion of serum.

A case presenting these symptoms can hardly be mistaken for any other. Pain, limited in extent at first, but becoming gradually or rapidly more general, and being greatly aggravated by even the least pressure, accompanied by a good deal of febrile and constitutional disturbance, is as surely indicative of peritonitis as an attack of severe pain without febrile disturbance, and being rather relieved than otherwise by pressure, implies colic.

When a fatal termination is approaching, the abdomen often becomes much distended, the pulse very quick and weak, the countenance ghastly, and death occurs from exhaustion.

Kirsch considers that the *Prognosis* in children is more favourable than it is in adults, and that when the affection occurs in girls, between the ages of five and eight, it is an important factor in the production of subsequent sterility, owing to the nutrition of the ovaries being interfered with by the contraction of the lymph deposited in them.

Treatment.—Hot anodyne fomentations, linseed poultices, with laudanum, and mercury, but especially opium—in as large doses as the child will bear—are the remedies on which we should advise the practitioner to rely. Of course general and local bleeding is usually recommended; but the true physician will think for himself, and take all the circumstances of the case into consideration, before resorting to depletion. In regard to mercury also, it must be confessed that the evidence in favour of its anti-inflammatory value is by no means so conclusive as was formerly thought; at the same time if it be of value at all in inflammations, probably those of the serous membranes would afford the best evidence of it. The readiest mode of getting the system under its influence will be through the cutaneous absorbents: for this purpose two or three drachms of mercurial ointment are to be spread on muslin, and then laid upon the abdomen underneath the fomentation flannels. Where the sufferings are not relieved by opium given internally or applied externally, probably a hot bath, to which some laudanum may also be added, will speedily secure relief to pain, and at the same time reduce the constitutional disturbance. In all cases purgatives must be avoided as they often do the greatest mischief.

The diet must consist, at first, of barley-water, or iced water only; should the patient become very low, great good may be effected by the judicious use of wine and strong beef-tea.

In treating the inflammation, care must be taken not to let the sufferer die from exhaustion.

B. *Chronic Peritonitis.*—Though it is often stated that chronic peritonitis may result from acute inflammation of that structure, and be unconnected with any other morbid condition, especially with any other constitutional or diathetic disease, yet we have never met with such a case; and speaking from our own experience, we should say that in every case of so called chronic peritonitis the germ of the disease is to be found in a more or less well-marked tubercular diathesis; in other words, we believe that the deposition of tubercular matter in, or upon, the peritoneum is the cause and origin of all these cases. It may very likely be that an attack of acute peritonitis is, as it were, the starting-point of the mischief; but this is only what happens occasionally and even frequently in other tubercular states; simple inflammation in a tubercular child often assumes this specific form. In some cases, indeed, where there is no such tendency, a long exhaustive attack of inflammation will sometimes develop it. The reason for the opinion here given will appear subsequently in the description of the *post-mortem* appearances.

The *Symptoms* are usually somewhat obscure, the abdominal pain being slight, and the constitutional symptoms variable. Generally the first thing noticed, even before there are any distinct abdominal or peritoneal symptoms, is that the health gradually fails, the appetite becomes capricious, and occasional attacks of abdominal pain take place: the bowels are alternately relaxed and constipated, the sleep is disturbed, and the skin in found to be hot and dry at night, the temperature being notably and uniformly higher than normal. This point has already been referred to as one of the most distinguishing and constant signs of a tubercular diathesis. Soon the child begins to complain of pain and uneasiness in the bowels, with a certain amount of tenderness on pressure, and after a time slight effusion of fluid takes place, the abdomen enlarges, becomes tympanitic, there may be a doughy feeling above or below the umbilicus, from adhesion of the intestines, or fluctuation may be detected: while the superficial veins of the abdominal parietes are seen to be full and prominent. The motions from the first are dark and extremely offensive, and usually there is a good deal of slimy mucus; thirst is not a prominent symptom until the inflammation spreads, and then febrile disturbance is marked; vomiting is occasionally a very troublesome symptom.

As the disease progresses, which it usually does in a uniform manner, though occasionally there are remissions in the symptoms, the tubercular characteristics become still more strongly marked. The child loses flesh and strength, and the pain and general uneasiness increase in severity, the abdomen enlarges, and then sometimes diminishes again, even to less than its normal size, the abdominal walls sinking with the general emaciation, which at length becomes extreme, and death occurs either from exhaustion, consequent on long suffering and from inability to take or to profit by nourishment, or from the supervention of tubercular disease in some other organs, the lungs, brain, &c.

The duration of the disease varies greatly; in some it runs what may be called a rather acute or rapid course; in others it lingers on for months, and even years: the rapidity being influenced mainly by the degree of constitutional taint, in other words, by the amount of tubercular cachexia. Generally other organs or tissues become implicated, and symptoms referable to them arise; hence the final issue may be determined either by an attack of tubercular meningitis, or by pulmonary phthisis, or the child may sink from exhaustion consequent upon the long-continued abdominal suffering.

The *Diagnosis* of chronic or tubercular peritonitis, though difficult and almost impossible in its earlier stage, becomes sufficiently easy at last. The persistently deranged and mostly relaxed state of the bowels, with the more or less abiding pain and tenderness, the abdominal distension, the emaciation, the failing health and strength, and the general characteristics of the tubercular diathesis, these make up a picture which can hardly be mistaken for any other disease in this region or elsewhere.

Morbid Anatomy.—The *post-mortem* appearances are generally sufficiently well marked. In addition to the general emaciation, so suggestive of tuberculosis in children, there are usually evidences in the chest and in the glandular system to corroborate this opinion. In the abdomen itself, the first thing noticeable is the evidence of peritoneal inflammation in the shape of bands of adhesive lymph agglutinating the coils of intestine together and to the abdominal walls. These may be either soft and recent, or firm and of longer standing. When these adhesions are examined more closely, there will be found, in addition to the lymph, those yellow granular deposits which are characteristic of the tubercular state and which resemble very closely the condition observed after death in cases of tubercular meningitis. The changes which this deposition undergoes vary greatly; it may lead to acute peritonitis, with quantities of plastic lymph and serous exudation poured out, or there may be suppuration in the deposits with a sero-purulent fluid in the abdominal cavity. The tubercular deposit is most marked on the peritoneum lining the diaphragm or the abdominal parietes adjacent to the spleen; or on that investing the liver: or the deposit is abundant in the substance of the omentum, spleen, liver, and mesenteric glands. Lastly, it occasionally but very rarely happens, that adhesive inflammation takes place between the coils of intestine, where tubercular matter is also deposited, suppuration ensues, then ulceration, and in this way an opening is made between two portions of intestine.

The *Treatment* of tubercular peritonitis is, it need hardly be said, very unsatisfactory in its results; for, just as in the case of tubercular meningitis, our power of arresting the progress of the disease is very small indeed, and is limited entirely to the earlier stages. Probably, if we could be sure of the diagnosis, which we very seldom can, during what may be termed the premonitory stage, treatment might do something to arrest the progress of the case ere the symptoms became fully manifest; but when they are declared, there is nothing left for us to do but to treat the more urgent and pressing symptoms as they arise, to mitigate suffering, and to ease the passage of the little patient from this world to the next. In fulfilment of our first task, a carefully regulated and nutritious diet is of the utmost importance. Diarrhœa, which is often a very troublesome symptom, will be best combated by opium with the compound aromatic chalk powder: in our hands astringents have not generally been successful, but logwood and krameria are the best, sometimes ipecacuanha with or without opium (Dover's powder) has been very useful in this respect, but it seems one of the peculiar features of this disease, that what answers well in one case entirely disagrees in another. The abdomen should be supported by a double flannel bandage during the day, and a single one at night.

The symptom which next claims attention at our hands is the pain, the relief of which is of prime importance. We know of no better application for this purpose than warm linseed-meal poultices to the abdomen, to which fifteen or twenty drops of laudanum have been added. In some cases, lint soaked in belladonna liniment and laid over the body answers well, and in all cases opium internally, especially with camphor, in the form of paregoric, is required.

When the diarrhœa is stayed, cod-liver oil is the remedy on which we should place most reliance, and it should be given to the fullest extent that the child can bear. The œtherized form will often be retained and will answer well when the common oil disagrees.

As a rule, tonics of all kinds are not well borne; the mineral tonics are the least satisfactory, steel being seldom tolerated except in the most delicate form, the wine. The milder aromatic bitter tonics, calumba, cascarilla, chiretta, &c., are those we have found most agreeable, combined with an alkali. We need scarcely add that, in our opinion, depletion in any shape, and mercury in any form, is to be carefully eschewed. The same applies to iodine and its compounds. The general hygienic management of these cases is the same as for other forms of tubercular disease.

VI. TABES MESENTERICA.

Tabes mesenterica is the name given to that form of tubercular disease which attacks the mesenteric glands; it might indeed be termed abdominal phthisis in common with the tubercular form of chronic peritonitis.

The mesenteric glands are so small at birth that they can scarcely be distinguished; but about the period of dentition they gradually become more developed, in common with many of the other glands of the body; and it is at this period that they often take on diseased action and become the seat of tubercular deposits, especially in badly-tended and imperfectly-nourished children. The liability to tabes mesenterica may be said to extend chiefly, though of course not entirely, from the eighth month to the eighth or tenth year.

Symptoms.—The symptoms bear a strong analogy to those which have just been described as significant of tubercular peritonitis. They consist principally of more or less constant and sometimes severe pain in the bowels, causing the child to keep his legs drawn up towards his belly. The lips are of a deep red, and the angles of the mouth are covered with small ulcers, or the whole lip is fissured. The bowels are variable, though generally relaxed; the motions are often unhealthy, of a light clay colour, and extremely fœtid. The abdomen is sometimes swollen and tense, though generally much less so than when the peritoneum is involved; the other parts of the body are so wasted away that an extreme degree of emaciation exists—hence the name *tabes;* there is great pallor, and general debility which increases rapidly. The enlarged glands in the mesentery can sometimes, though rarely, be felt through the attenuated abdominal parietes, when the disease has become thoroughly established. The inguinal glands participate somewhat with their enlargement. Obstinate diarrhœa often sets in, with hectic fever, &c. Symptoms of pulmonary consumption may supervene, or the irritation of the enlarged glands may produce acute and fatal abdominal inflammation, or the child may die worn out by the disease, unless some remission takes place. When recovery does fortunately occur, the period of convalescence is protracted; and great caution will be required, during its progress, to shield the patient from relapses, as also from all contagious and other infantile disorders.

The *Treatment* consists of a mild nourishing diet adapted to the child's age and strength; asses' milk and farinaceous preparations being very useful. Cod-liver oil will be of great benefit in all cases, especially when given with vegetable tonics; the syrup of the iodide of iron is also sometimes valuable. The general character of the treatment will, as a rule, be very much the same as that recommended for cases of tubercular peritonitis, with which disease tabes has much in common, both alike springing, as it were, from the same root. The following formula is highly recommended by Dr. Lubert, of Héricourt (Haute-Saône): Tincture rhei, 30 parts; liquor potassæ acetatis, 8 parts; vinum antimonialis, 4 parts. The mixture to be given in doses of from 10 to 20 drops, according to the age of the patient, in a teaspoonful of sugared water three times a day. This treatment should be continued for some time after recovery: it is only contra-indicated in cases of well-marked fever and considerable diarrhœa.

Change of air, especially to the sea-side, warm or tepid salt water baths, and good animal food, provided it can be digested, will often work wonders.

VII. TYPHLITIS AND PERITYPHLITIS.

These two affections, the one a sequence of the other, are comparatively rare, both in childhood and adult life. In *typhlitis* we have an inflammation of the cœcum, generally due to the lodgment of hardened fæces or some foreign body in this part of the intestine, or in the appendix vermiformis, often ultimately leading to ulceration and perforation. Should perforation occur, it may take place into the peritoneum, causing peritonitis; or into the adjacent cellular tissue, setting up inflammation there—*perityphlitis*—which generally terminates in the formation of an abscess, and this, if not opened, may burst in a variety of directions. Typhlitis may also be produced by other forms of ulceration; from mere distension; or by some extrinsic growth.

The *Symptoms* of typhlitis are pain and tenderness over the abdomen, but specially marked in the *right iliac fossa,* sometimes distinct physical signs of an accumulation in the cœcum, and constipation, followed by mucous or muco-prevalent diarrhœa. According to the severity of the symptoms, so will be prominently brought out all the signs of abdominal trouble: except that not both, but only the *right* leg will be flexed. Should there be an analogous inflammation in the sigmoid flexure, the physical signs would be reversed. In perityphlitis the symptoms of the formation of an abscess would be added.

The *Treatment* consists in constant warm fomentation and poulticing, and the internal exhibition of opium. If any accumulation can be detected, it should be gently manipulated in the line of the colon. If an abscess forms, it must be encouraged and opened as early as possible. The patient should be supported with liquids, and, if necessary, by nutrient enemata. Great care is necessary during convalescence.

VIII. DISEASES OF THE LIVER.

1. JAUNDICE.—Icterus, or jaundice, is rather a symptom of some affection of the liver than a separate disease. It is a condition at once recognizéd by the yellow hue of the skin and conjunctiva, by the dark-saffron tint of the urine, and by the white or light clay colour of the intestinal evacuations.

Infantile jaundice—*icterus neonatorum*—is generally a trivial disorder, occurring a few days after birth, and usually disappearing gradually and spontaneously in about a week. It is most common in premature and feeble children, and is most intense in infants affected with sclerema and pulmonary atelectasis: it is probably unconnected with any primary affection of the liver, but is a secondary hepatic disorder due to defective respiration, to breathing a cold or vitiated air, or to imperfect performance of the functions of the skin. Of all causes, probably exposure to cold is the most frequent, for we find that children who are most carefully tended very seldom become affected, while, on the other hand, children who are exposed to changes of temperature seldom escape it.

But besides these simple cases, jaundice sometimes depends on more serious causes; such as congenital absence of the hepatic or cystic biliary ducts, or an obstruction of these ducts by inspissated bile. In these cases there is a decided tendency to hæmorrhage, which often takes place from the umbilicus at about the period of the separation of the funis. If the bleeding be controlled, and life is prolonged, general atrophy usually comes on; and is followed by exhausting diarrhœa, death occurring at the end of two or three weeks. Jaundice may also depend on peritonitis, enteritis, or phlebitis of the umbilical veins.

During childhood, jaundice may occur and have its origin in the same conditions as give rise to it in the adult. Thus it may be produced in two ways:—1st. By some temporary impediment to the flow of bile into the duodenum, and the consequent absorption of the retained bile; and, 2nd, by defective secretion on the part of the liver, so that the principal constituents of the bile are not separated from the blood.

The most common impediment to the flow of bile into the duodenum, is the impaction of one or more *gall stones* in the ductus communis choledochus. These concretions consist of inspissated bile, chiefly perhaps of cholesterine—a peculiar fatty substance, which exists in a state of solution in healthy bile, but which, under certain circumstances, becomes released from its solvent, and assumes its natural crystalline from. In all cases the nucleus of the concretion consists of a small piece of solid biliary matter, or of inspissated bile cemented by mucus. When the obstructing stone or stones have passed into the duodenum, they are voided with the fæces; and, the cause of the jaundice being removed, the skin gradually assumes its natural colour. The other causes of jaundice from obstructed gall-ducts are, cancer of the liver or pancreas, closure of the ducts from adhesive inflammation of the liver, from spasm of the ducts, and from constipation, the loaded intestine pressing upon the duct, and so impeding the flow of bile. The secretion of bile may be suppressed or rendered defective by congestion and inflammation of the liver; by mental shocks, grief, or fits of anger; by the presence of certain poisons in the blood; and by some disorders of the stomach. Frerichs says that icterus neonatorum is due to the diminished tonicity of the capillaries of the parenchyma of the liver, which takes place when the flow from the umbilical vein is stopped, thus inducing the increase of bile in the blood. Virchow thinks it results from catarrh and stoppage of the bile-duct.

Treatment.—In simple cases nothing, as a rule, will be needed beyond attention to the clothing of the infant, and keeping the air of its apartment pure and warm: in some cases perhaps the administration of a dose or two of some mild laxative may be required. If the mother be unable from any cause to suckle the child, a strong healthy wet-nurse should be procured.

The other varieties of jaundice will have to be treated on principles varying with the nature of the cause. Where there is congenital absence of the hepatic or cystic biliary ducts, all attempts to materially prolong life will be unavailing; and we must be content with alleviating as far as possible any distressing symptoms that may arise. In jaundice from the obstruction of gall stones, hot baths, warm fomentations, hot alkaline drinks, saline purgatives and sedatives, are the remedies on which to rely. When the diagnosis points to defective secretion as the cause of the disturbance, we may perhaps cautiously try the effect of mercury, or taraxacum, or the dilute nitro-muriatic acid in small doses; but in most instances, as we shall be merely working in the dark, it will be better to rest contented with saline purgatives, diaphoretics, baths, rest and regulated diet.

2. Enlargement of the Liver.—Inflammatory affections of the liver are so very rare in the young, that it is unnecessary to describe them in these pages. A peculiar enlargement of the gland, however, not infrequently occurs in feeble delicate children. The abdomen gradually enlarges, so that the little patient is said to be "pot-bellied;" and on examination one or more well-defined tumours are discovered. These tumours are formed by the enlarged liver, with perhaps an enlarged spleen also; the increase in size in both cases being due to the interstitial deposit of an albuminous or amyloid material. As this foreign material is soft, and has no tendency to contract like the lymph poured out in ordinary inflammation, it does not much impede the passage of the blood through the liver, or the escape of the bile through the ducts; hence it very seldom gives rise to serious disturbance. Should the same material, however,

become deposited in the structure of the kidneys, then the functions of these glands become so completely interfered with that the cases cease to be amenable to treatment; and albuminuria, ascites, and anasarca ensue, from which death ultimately results.

The peculiar condition just described is probably the consequence of a scrofulous or syphilitic cachexia. It occurs also very unmistakably in cases of confirmed rickets. In its highest degree, in the liver, it is most frequently found—according to Dr. Budd—in young persons who have long suffered from scrofulous caries. Occasionally, however, there is no disease of the bones, but the patient is much wasted by general scrofulous disease. The following case—related by Portal in his *Observations sur les Maladies du Foie*—may be quoted as a characteristic example:—A boy, eight years of age, gradually became terribly emaciated. The submaxillary glands were enlarged, and on each side of the neck was a string of enlarged cervical glands: the liver extended low in the belly. The child was in a low fever, had a great distaste for all kinds of food, and died a fortnight after he was first seen by Portal. On dissection, the maxillary glands, the glands on each side of the neck, and the bronchial and mesenteric glands, were found enlarged and filled with a substance like plaster. The liver was of a prodigious size: when stripped of its capsule, the substance appeared whitish; in the interior it was still whiter than on the surface. On the surface, as well as in the interior, were lymphatic vessels containing a substance so thick that they formed small hard cylinders. The matter with which the liver was gorged had the same whiteness. A slice of the liver, exposed to heat, to the action of boiling water, or to that of alcohol, was hardened like albumen.

The liver may be enlarged in cases of heart disease, as a result of obstructing the circulation; in some cases of dyspepsia, in children between the ages of two and four years, but readily yielding to an alterative treatment; as the result of fatty deposit, especially in connection with laryngismus stridulus; and from malignant disease.

When only the liver and spleen—either separately or together—are affected, proper remedial measures do great good; and it is probable that under their use the enlargement will diminish, and may perhaps even disappear. As in all cases there are obvious indications of a scrofulous, rachitic, or syphilitic habit, our treatment must be directed to the improvement of the general nutrition. A digestible nourishing diet, sea air, and tepid salt-water baths, will be of the greatest benefit; especially if, at the same time, cod-liver oil, iodide of potassium, and the iodide of iron, be administered in combination. If there be any signs of a depraved appetite—of pica, as it is called—the child must be prevented from indulging its morbid fancies; while attempts are made to restore the healthy functions of the stomach by giving the mineral acids with some bitter infusion, together with small doses of pepsine, at those meals when animal food is taken.

3. Hydatid Tumours of the Liver.—Hydatid tumours are found in the liver more frequently than in any other organ. They are most common between the ages of twenty and forty; but they may occur at any age from six years to fifty. Dr. George Budd, in his work on *Diseases of the Liver*, states that he has found no instance recorded in which such a tumour occurred under the age of five or six years, or above that of fifty-two.

An hydatid tumour consists of a sac, lined by a thin bladder or cyst, and filled with a limpid colourless fluid; floating in this fluid, numerous small cysts, similar to the cyst lining the sac, and varying in size from a pea to a pigeon's egg, are usually found. To these cysts or bladders Laennec gives the name acephalocyst—a bladder without a head. The acephalocyst lining the sac is composed of finely-laminated friable coats, about the firmness of coagulated albumen. Sometimes it contains no floating hydatids, or very few; while in other cases it is literally crammed with them; and these, again, it is said, may contain another generation. To distinguish these different kinds, as well as to mark the mode of their increase, naturalists have divided these productions into two species. 1st, the *acephalocystis endogena* of Kuhn, likewise called *socialis vel prolifera* of Cruveilhier, the *pill-box hydatid* of Hunter, which is the kind most commonly developed in the human subject, and in which the fissiparous process of generation takes place usually from the internal surface of the parent cyst, the progeny being sometimes successively included; 2nd, the *acephalocystis exogena* of Kuhn, *eremita, vel sterilis* of Cruveilhier, which develops its progeny generally from the external surface, and is found in the ox and other domestic animals. The true nature of these acephalocysts has long been the subject of investigation. M. Livois seems, however, to have settled the question by his discovery that they are the dwelling-place of those minute animalcules, to which Rudolphi gave the name *echinococcus*, from the cylinder of hooks surrounding the head. M. Livois states that echinococci exist in all acephalocysts, and this observation has been confirmed by Dr. Budd and other authorities.

Symptoms.—When an hydatid tumour forms in the liver, its growth is generally slow. It gives rise to little inconvenience beyond a sensation of weight, so that its presence is not often suspected until found after death. When the tumour is of large size, it may then be easily felt; sometimes it compresses the portal vein, or vena cava, producing ascites and œdema of the legs. It may burst into the peritoneum—causing fatal peritonitis, or into the lung, or into the intestines, or through the abdominal wall; in the two latter cases, the contents will often be entirely discharged, and the sac ultimately closing up, will leave the patient well. When the tumour opens into the lung, the patient becomes so worn out with the constant expectoration of hydatids and puriform matter, and the constitutional disturbance is so severe, that he generally sinks under it.

Sometimes an hydatid tumour gets well without opening, namely, by the secretion of a thick putty-like matter within its sac, owing either to the destruction, or at all events causing the destruction, of the hydatids.

Treatment.—Two agents, iodide of potassium and common salt, are supposed to possess the power of stopping the growth of these tumours. Confirmatory evidence is still required, however, to prove conclusively the value of these remedies, and we must confess that we doubt very much whether any such evidence will ever be forthcoming.

4. CIRRHOSIS OF THE LIVER.—This affection for a long time was supposed to be due wholly to the abuse of alcohol, until it was observed in young children. It is, however, a rare disease among them, and has been generally discovered after death. Unterburger and Stiffen have recorded three cases associated with ascites, in which the right lobe was attacked, the reverse of the order in adults.

IX. DISEASES OF THE SPLEEN.

We have already noticed that the spleen often participates in the enlargement of the liver, when that organ is the seat of an interstitial deposit of an albuminous or amyloid material. It is also sometimes increased in size as a consequence of repeated attacks of ague; and, together with other organs, is liable to congestion, hyperæmia, cancer, hydatid tumour, and tubercular deposit. In the adult, it is the favourite seat for the lodgment of emboli giving rise to hæmorrhagic infarctions.

LEUCOCYTHÆMIA, OR LEUCÆMIA.—In this affection there is an excess of white corpuscles in the blood, and the lymphatic tissue of the spleen and lymphatic glands, and sometimes that of the liver, kidneys, and other organs is greatly increased. Two forms of the affection have been described, one in which the spleen alone is involved, and the other in which only the lymphatic glands are enlarged. The etiology of the disease is uncertain, but there is very little doubt that the increase of the white blood-corpuscles is essentially due to excessive formation in the spleen and glands. Dr. West is of opinion "that this state of the spleen, as well as the constitutional condition with which it is associated, often date back to early infancy." He has met with them in a child only three months old, but the majority of his cases have varied between the ages of nine and fifteen months.

Morbid Anatomy.—The capsule of the spleen is generally thickened and opaque: there may be adhesions. The organ itself is increased in size, weight, and consistency. On examination the trabeculæ are found to be thickened, but the chief seat of lesion is situated in the Malpighian corpuscles, which are considerably hypertrophied and nourished by numerous blood-vessels. On section these corpuscles appear as firm, whitish, irregular nodules surrounded by atrophied pulp. When the lymphatic glands are involved, they are also increased in size, the cortical portion being thickened and the gland portion in excess. At times, they form large tumours, and on section a turbid fluid is set free. The changes in the blood consist of abundant small cells and free nuclei.

Symptoms.—The disease generally exists for some time without being recognized. There may be fulness and a sense of weight about the abdomen, digestive derangement, vomiting, and diarrhœa. Attention, however, is first called to the malady by a peculiar sallow pallor, called the splenic cachexia, though the child may appear well nourished. The spleen is then percussed and found to be increased in size: it may ultimately assume large proportions, extending into the right iliac region, causing pressure symptoms in adjacent organs, together with distension of the veins of the abdominal parietes. A microscopical examination of the blood reveals a large excess of white corpuscles. At first there may be no febrile disturbance, but towards the close the temperature is persistently high. Epistaxis, or hæmatemesis, may be prominent symptoms. When the glands are specially involved, they may form a " necklace " extending to the armpits.

Prognosis.—Affections of the spleen, except those of a malignant type, are generally chronic, and are rarely dangerous. Leucocythæmia is said to be incurable, but we demur to this dictum, as we have certainly seen cases permanently relieved, if not cured, when the lymphatic glands have been alone affected.

Treatment.—The general health must be improved by diet and change of air to dry climate, and the blood dyscrasia combated by quinine, iron, and the mineral acids. The enlarged lymphatic glands must be painted with iodine, and if the disease be limited to them, gradually increasing doses of Fowler's solution should be exhibited internally.

CHAPTER V.

DISEASES OF THE URINARY SYSTEM.

I. INTRODUCTORY REMARKS.

THOUGH the subject of renal diseases in early life is one which does not usually receive any very great amount of attention from systematic writers on children's diseases, there is nevertheless sufficient evidence in our mortality tables to prove that, measured by this standard, it is a matter of great importance. We find, for instance, that in the Report of the Registrar-General for the year 1876, there died from renal disease in England alone no less than 898 children under fifteen years of age, and of these 485 died under five years of age. When we come to analyze these facts a little further, we find that the following were the specific renal diseases with the numbers of fatal cases of each:—

	Under 1 Year.	1	2	3	4	5–10	10–15	Total.
Nephritis . . .	31	45	50	38	42	93	32	331
Ischuria	4	2	—	—	3	3	—	12
Nephria	19	37	31	40	31	105	70	333
Diabetes	—	1	2	—	—	8	28	39
Stone	—	1	2	2	—	5	3	13
Cystitis	1	—	—	—	—	2	4	7
Kidney Disease .	46	18	18	8	13	34	26	163
Total . .	101	104	103	88	89	250	163	898

The term Nephria in this table is used as synonymous with Bright's Disease, and it thus appears that out of a mortality of 898 from all kinds of renal disease in children under fifteen years of age, no less than 333 died of Bright's Disease, of which 175 were between the ages of five and fifteen.

It is not improbable that, if greater attention were given to the subject, the mortality from renal diseases would be found to be much greater than is here indicated; for in our own experience we have noticed, that morbid conditions of the urine, and especially albuminuria are much more frequent accompaniments of other diseases in children than is commonly supposed. It is likely, therefore, that the supervention of renal disease may not seldom be the turning point in the history of other acute diseases of childhood, though the fact eludes observation.

Before proceeding to the consideration of the diseases of the kidney, we may profitably notice four conditions connected with the voidance of the urine, which may or may not be due to renal disease, but are often associated with it—viz., difficult micturition, or dysuria; excessive secretion of urine, or diuresis; diabetes; and incontinence of urine.

II. DYSURIA.

Dysuria, or painful micturition, may occur as the result either of a morbid condition of urine, the characteristic feature of which is great acidity, from an excess of uric acid; or it may result from a diseased state of the urinary passages. In boys, from elongation of the prepuce and its consequent irritation and inflammation: or in either sex, from inflammation of the meatus urinarius; or, lastly, from the presence of a urinary calculus in the bladder. Ascarides in the rectum also occasionally leads to some difficulty in micturition, though generally this is rather in the way of incontinence than of dysuria.

The amount of pain varies greatly; in some it is only a passing discomfort due merely to slight acidity of urine, the result of febrile disturbance, while in others the pain is so excessive that the child screams out and is sometimes almost in convulsions with agony. Whenever the urine is scanty in amount, from whatever cause, it is sure to be high coloured, rich in lithic acid by mere concentration, and consequently difficult to pass. A condition such as this is known at once, in the absence of any more positive signs, by the evidence afforded by test paper, perhaps by the presence of lithic acid deposits, if not naturally, yet always and quickly, by the addition of a little nitric acid. Such a state is usually associated with some feverishness, often with disturbance of the digestive functions, and is very commonly connected with chronic skin disease, with rheumatism, or with a generally acid state of the system.

But the urine may be perfectly normal, at least it may be free from any excess of acidity, and the fault may rest in the urinary passage. With boys it sometimes happens that the foreskin is abnormally long, and the orifice preternaturally contracted. In such a case the loose integument becomes irritated and inflamed, either by the urine passing over it, or perhaps from friction with the child's clothes, and on examination it will be found that the orifice of the prepuce is red, swollen, and painful to the touch, micturition in such a case being often extremely painful. Sometimes another abnormal condition exists to which the name *Phymosis* has been given.

This term signifies a preternatural constriction of the orifice of the prepuce, so that the glans penis cannot be uncovered. Most children are born with the opening of the prepuce too small to allow of the complete retraction of the foreskin; but as the orifice becomes naturally dilated about the time of puberty, nothing need be done unless the opening is so small as not to allow the urine to pass except with great pain, a condition which often occurs if the part be at all inflamed. Should this prove to be the case, the preputial orifice must be cautiously slit up, or circumcision may be performed; the latter is the most advisable proceeding wherever there is in conjunction with the above an elongated condition of the foreskin.

Another condition sometimes met with in boys, and which may also give rise to great difficulty in micturition, is that known by the term *Paraphymosis*, which consists of the retraction of a tight prepuce over the glans penis, with swelling of the parts so as to prevent its return. This swelling is quickly followed by inflammation, which may even run on to gangrene of the constricted glans as well as of the constricting ring of foreskin. In such a case the everted prepuce should be replaced as quickly as possible. Ice or cold water should be applied for a few minutes to reduce the swelling, and then gentle but persevering attempts should be made to draw the prepuce gently forwards whilst the glans is pressed back: chloroform will greatly aid this proceeding. If these attempts fail, the constricting ring of foreskin must be divided with a bistoury, and simple water-dressing be applied till the part has healed.

The only remaining cause of dysuria to which we need now refer is, the presence of a *calculus in the urinary bladder*. It sometimes happens, though an occurrence of rarity in childhood, that a calculus forms in the kidney, and may become lodged in the ureter. The symptoms of stone in the kidney are, pain of a continuous and severe form, situate in the loins, but most in the affected side, extending through to the front and all round the waist, as if girt with a tight cord, shooting also down the ureter and causing retraction of the testicle. If the stone emerges from the kidney, and enters the ureter, but can get no farther, its presence there will be indicated by severe pain which shoots down through the groin, and along the inner side of the thigh, as well as into the scrotum. When the stone has entered the bladder, there is frequent micturition, with occasionally severe dysuria, the flow of urine often suddenly stopping with an accession of pain, especially at the extreme ends of the penis, occasional hæmaturia, sometimes pus is present in the urine, and sometimes there are lithic acid deposits.

In the case of girls, dysuria is generally due either to excessive acidity of the urine, or to inflammation of the passages, or to the existence of a vascular growth at the orifice of the meatus.

The *Treatment* of dysuria, whether in boys or girls, will of course vary with the cause. In both, when the pain is due to excessive acidity, alkalis, and salts of the vegetable acids, acetates, tartrates and citrates, which are converted into carbonates in the system, together with the liquor potassæ, will be the most fitting remedies. Much relief will also be afforded by the free administration of the so-called diluents, of which plain water or mucilaginous liquids are perhaps the best. Diet is a matter of great importance; no malt liquor, nor any but the most delicate white wines, and perhaps not even these can be allowed, while a sparing and non-stimulating dietary must be strictly enforced. When any malformation exists, such as has been alluded to, the proper remedy will be an operation for its removal. Stone in the kidney admits of no cure by art; our only resource lies in the mitigation of pain, and in the free dilution of the urine by alkaline or other drinks. Stone in the bladder is to be remedied either by lithotomy or lithotrity, the latter being seldom practised in the young.

The existence of a vascular tumour of the meatus in girls can be demonstrated only by ocular examination, and may be treated by ablation with the knife, or by the application of fuming nitric acid, or a saturated solution of chromic acid.

III. INCONTINENCE OF URINE.

Incontinence of urine may in some respects be regarded as the opposite of that we have just considered; it occurs in early life from a great variety of causes: and may exist in either sex, more especially the male, by night or by day, or both, but is much more frequent by night only. In the majority of cases the affection is intermitting, *i.e.*, it is worse at one period than another. We have met with it in all the members of a family, and it has seemed to be due then to constitutional peculiarity. It may be associated with renal disease, or with a disposition to gravel, or it may depend upon constitutional weakness and irritability, or it may be due to an increase of uric acid in the urine.

The incontinence of urine which occurs during sleep, and is so common in young children, may result from any of the causes last specified: in all cases, therefore, the renal secretion should be examined. Very frequently this affection is the consequence of bad habits; being favoured by the free use of fluids during the after part of the day, by exposure to cold in the night, and by lying on the back—a posture which seems to be very unfavourable to the retention of the urine, especially when the natural sensibility of the mucous membrane of the neck of the bladder is at all increased. Another cause of incontinence of urine is the presence of ascarides in the rectum. This we have observed in many instances; a loaded state of the bowel will also induce, and sometimes we have known it result from, the presence of a small calculus in the bladder. It should be always borne in mind that incontinence of urine is a symptom of that form of epilepsy in which the fits only occur during sleep, and that it is an important factor in the diagnosis of diabetes mellitus.

In the *Treatment* of these cases we must be careful to make the little patient abstain from fluids for three or four hours before going to bed: he should also be taken up to empty his bladder twice or thrice during the night: and when the position appears to influence the case, some good may result from tying a cotton reel over his spinal column, so that when he turns round upon his back he may at once be awoke. At the same time we should try to give strength and tone to his system by the use of the cold douche, especially to the spine, open-air exercise, and by the administration of the bromide and iodide of iron, and the tincture of the perchloride of iron with quinine. In some very inveterate cases, the application of a succession of small blisters over the sacrum has effected a cure: but such agents should be avoided, if possible. Where the bladder is very irritable a belladonna plaster over the loins and sacrum will often be very useful: or four or five grains of the extract of this drug may be rubbed into the same region every night. In other cases, where there has been a want of power in the bladder generally, we have found good result from the addition to the perchloride of iron and quinine mixture of ergot of rye in 5 minim doses of the extract, to a child five or six years of age. Nux vomica in the form of tincture in doses of one to two minims for a child six or eight years of age is also very useful, and in cases where the urine is thick with lithates, the dilute nitro-muriatic acid is of great service. We have also obtained good results from administering a decoction of the *pedalium murex*—a pint daily. Lastly, belladonna is a remedy which has found favour with many practitioners, though it has signally failed in our hands. It has recently been asserted that the total abstaining from meat has proved successful. These remedies will be of no avail if the symptoms are due to the presence of stone; nor will much good result from them if the condition in question be the result of bad habits.

IV. DIURESIS.

The term *diuresis* merely implies the existence of an increased flow of urine: it may occur in young children, as in adults, from a variety of causes, and is a symptom of very various diseases. Thus, the disturbance in question may be merely a secondary affection, arising from gastric and intestinal disorder; or it may be associated with the tuberculous cachexia; or it may occur merely as a coincidence, but not as a symptom of other diseases; or lastly, it may be due to true diabetes, which we shall presently describe: though so uncommon is this disease in the young, that Dr. Prout, out of nearly seven hundred cases, only saw one in a child under five years of age.

There is, however, a remarkable form of diuresis, which was first described by Dr. Prout, in his work *On the Nature and Treatment of Stomach and Renal Diseases*, as not uncommonly occurring soon after the period of weaning. The *Symptoms* as described by him are as follow:—The child, who may have previously been very healthy, begins to get dull, inactive, and to lose flesh; the skin feels harsh, dry, and hot; the bowels are irregular; the motions assume an unnatural greenish appearance; and the abdomen becomes prominent, so as to lead to the suspicion of mesenteric disease. At this period the urine is generally scanty and high coloured; becomes turbid immediately on cooling; and lets fall a pale clay-coloured deposit of lithate of ammonia, sometimes intermixed with the oxalate of lime, or with an excess of phosphates. As the disease proceeds, the quantity of urine rapidly increases, and the thirst being commensurate, large quantities of fluid are consequently taken; so that an infant about twelve or eighteen months old will often be found to pass from two to four or five pints of urine in the twenty-four hours. It often happens, however, that this symptom, remarkable as it is when attention has once been called to it, entirely escapes observation for a long time, and it is only after the child has become a good deal emaciated, apparently from no very obvious cause, that this point is discovered: it is one nevertheless which should always be inquired after when the health of a child is failing, when he is losing flesh, and when great thirst exists. The urine at this and all the subsequent stages of the affection is commonly transparent, and of a pale-yellow or greenish tint. Its specific gravity varies from 1·010 to 1·025; and on examination it will be found to contain a great excess of urea, and occasionally, but very rarely, traces of albumen or sugar.

This form of diuresis is sometimes rather formidable, not so much on account of itself, perhaps, as for the indication which it too commonly affords of some defect in the assimilative functions, which may resist all our efforts, and ultimately lead to extreme emaciation, and to the development of some serious organic lesion; sometimes, and especially if it be neglected or maltreated, it ends in organic disease of the kidney, and in some cases it has apparently led to diabetes. It most frequently occurs in strumous children, who are at the same time dyspeptic; especially if they have been improperly nourished, or been brought up in confined and imperfectly-ventilated apartments.

The general principles of *Treatment* are—removal to a pure country atmosphere, or to the sea-side, where a bracing dry air can be breathed; the employment of tepid or warm sea-water baths; attention to diet—animal food, with plenty of milk, being most suitable; a gradual but steady diminution in the quantity of fluids allowed; and the administration of small doses of Dover's powder to increase the action of the skin, as well as to relieve the general irritability. Gentle aperients will be needed to regulate the state of the bowels; pepsine should be tried, if any indications of dyspepsia present themselves; and lastly, tonics of bark, quinine, or steel, will prove highly useful. Dr. Venables recommends more especially the phosphate of iron, and from our own experience we believe this to be a very valuable preparation for many of the conditions of childhood requiring a chalybeate tonic. Should any sugar be present in the urine, starchy food and saccharine matter should as much as possible be avoided. On this subject the reader is referred to the next section, on *Diabetes.*

V. DIABETES MELLITUS.

We have already remarked, when considering the subject of diuresis, upon the extreme rarity of this disease in children. The late Dr. Prout, who had special opportunities of observing it, only met with one case out of about 700; and Dr. West, who has probably seen more of children's diseases than any other authority in this country, has only seen five cases: 1, in a little girl, aged three years and a half, whose brother had died at the age of two years; 2, her sister at two years and a half, with precisely the same symptoms as she presented, and from the first appearance of which to their fatal termination in both cases only six weeks elapsed; 3, a girl, aged ten, died suddenly four months after the commencement of her illness, and apparently as the immediate result of mental shock; 4, a girl, aged seven years and nine months, sank from general tuberculosis at the end of six months; and 5, a boy, seven years of age, has now been kept in moderate health for fifteen months (1874) since the return of his illness was discovered; the slightest relaxation of rules, with reference to his diet, is followed by the reappearance of sugar in his urine, and the return of all the signs of diabetes. The first case, unfortunately, Dr. West only saw once; and the second he saw but twice; it was that of a girl ten years of age, who first suffered from diabetes in the convalescent stage of measles eighteen months previously, and whose family had a phthisical taint. Bouchardat asserts that no age is free from glycosuria, that he has observed it in a child under three years of age, and in old men aged more than eighty, that the prognosis improves with age, and that he has not seen a case successfully treated under the age of fifteen. Durand-Fardel states that the examples of diabetes in children, which he has observed, have led him to conclude that the disease is not very dangerous in them, that it is more easily treated in childhood than after puberty, and that the prognosis improves with advancing age. Hirschsprung has tabulated some twelve cases, these were all he could collect, having regard to an accurate diagnosis.

The youngest subject in whom we have seen diabetes was that of a lad fourteen years of age: there was nothing in his previous history which threw any light upon the origin of the disease; his parents were healthy, and there was no hereditary diabetic tendency. The symptoms had developed gradually, and at the time when he came under our notice he was passing a daily average of five pints of urine, of high specific gravity, 1035 to 1040, and yielding abundant evidence of the presence of sugar. He was treated with a restricted diet, small doses of opium, such as two to three minims of the liquid extract, and the syrup of the phosphate of iron. In the course of two or three weeks there was a marked diminution in the quantity of urine passed and in its specific gravity, but at the end of that time we lost sight of him, because, as we believe, he was considered convalescent.

The *Symptoms* of diabetes in the child are very much the same as those in the adult, though the disease seems to be scarcely so well marked in the former as in the latter: this may arise partly, perhaps, from the rarity of the affection in children; partly because the symptoms are not so suggestive, at least not at first sight, in the child as in the adult; and partly, perhaps, because very much the same general symptoms are present in children without any diabetic tendency. There can, however, be no difficulty in recognizing the disease when once it is fairly developed, and a simple examination of the urine will generally set the question at rest one way or other. Suppose, for instance, that a child is failing in health, that it is losing flesh, is afflicted with carbuncles or boils, and has at the same time a craving appetite, with very great thirst, and a dry harsh skin, and coated tongue, obstinate constipation, and, in the female, erythema around the vulva: if, in addition to all this, there is a frequent desire to pass water, and not only so but that a large quantity of pale liquid urine is voided, having a peculiar sweet odour not unlike that of ripe apples: all this ought at once to excite suspicion, and lead to an examination of the urine, when the nature of the case will be at once apparent by its yielding the characteristic results if sugar be present. One of these is the high specific gravity of the water, which ranges from 1030 to 1050: the normal specific gravity being 1010 to 1020. The other results will be determined by the chemical examination of the urine, which is to be conducted in one of the two following methods.

The first and most distinctive test of the presence of sugar is that which is called "Trommer's" test. A few drops of a saturated solution of the sulphate of copper is added to some of the suspected urine in a test tube; some liquor potassæ is then to be added: this decomposes the sulphate of copper, the blue oxide of copper is set free and sulphate of potash is formed; when this is boiled, if sugar be present the blue protoxide is reduced to the suboxide, the reduction being manifested by a change of colour from blue to a reddish brown. If no sugar be present no such change is effected. This test is exceedingly delicate, and is very characteristic. The other test, to which the name of its discoverer, "Moore," is given, depends for its efficacy upon the power which caustic potash has of decomposing sugar: it is applied thus:—To a little of the suspected urine in a test tube, some liquor potassæ is to be added and then boiled, when, if sugar be present, the solution will change to a rich mahogany brown colour. By one or other of these tests the existence of diabetes mellitus can readily be proved. It is necessary that the test solutions should be fresh, otherwise the reactions will be fallacious.

The duration of this disease is from five days to four months. It may become chronic and last for one or two years.

As regards the *Pathology* of this disease, we are unable at present to say much that is definite and positive; more perhaps is known negatively, if we may so say; and it is probable that diabetes should be classed as a disease of the digestive rather than of the urinary system; for there is no doubt that whatever may be the exact nature or cause of the derangement, it is due primarily to a disturbance in the assimilative processes. Senator has pointed out that, although the liver, which experiments in the artificial production of the disease show as playing an important part in the pathogenesis of diabetes mellitus, is comparatively more developed in children than in adults; on the other hand, their food, consisting chiefly of amylaceous matters, would seem at first glance to indicate the contrary. Perhaps the rarity of the disease in childhood is due to the fact that children are not very subject to derangements of the nervous system. Schweitz of Neuenahr, considers that in most cases the disease is congenital and inherited.

In reference to the *Treatment* of diabetes mellitus, it seemed until lately that this was almost uniformly unsuccessful, and that the disease was to be regarded as intractable. Now, however, as a clearer insight is being obtained into the pathology, treatment has become of a more hopeful character. The question of diet is of primary importance, for no plan of treatment can boast of much success which is not at the same time aided by a rigorous exclusion of all starchy and saccharine matters. By this means alone, and without the use of any drug, many cases have been completely cured. The rest of the diet may be as nutritious and as stimulating as seems requisite. Bouchardat recommends a purely animal diet with some aperient natural water, as Carlsbad, to regulate the bowels. In regard to medicines, there is scarcely any limit to the number of so-called remedies, which have been recommended. Emetics, purgatives, sedatives, and tonics, have, one after another and in various ways, been tried with pretty much the same successful or unsuccessful results. Lately, it has seemed as if opium possessed the greatest power of diminishing the amount of sugar in the urine, as well as of the amount of urine secreted; but quite recently Dr. Pavy, who has had great experience and most success with this drug, made the discovery that, with a restricted diet, the results obtained were just as satisfactory when opium was not given. He has since demonstrated that the exhibition of alkalies arrests the transformation of the glyconic material into sugar. The plan, therefore, which we would recommend is: first, a rigidly enforced restriction in diet, avoiding all starchy and saccharine food; secondly, the administration of alkalies, and, after, of the dilute nitro-muriatic acid with some vegetable bitter, attention being also paid to the state of the digestive organs; and lastly, if these means fail in arresting the excessive diuresis, and in diminishing the amount of sugar eliminated, then opium, in minute but gradually increasing doses; remembering, in regard to the effect of opium, that though, on the one hand, it is true that children as a rule are remarkably susceptible to the influence of opium, yet, on the other hand, diabetic patients show a most extraordinary tolerance of it. Brinde has recorded a case in which he was enabled to stop the excretion of sugar, and to increase the body weight by strictly adhering to an animal diet, and administering a combination of glycerine (6 parts), tartaric acid (1 part), and water (40 parts). The patient became robust: the glycosuria, however, would return with the use of a comparatively small quantity of carbo-hydrates.

The thirst may be relieved by water, by skimmed milk, by acid drinks—especially that containing phosphoric acid, or by a solution of cream of tartar. Tepid liquids assuage the thirst better than cold. The patient should at all times be well clothed in flannel, and should have several warm baths each week. Change of air and sea-bathing are useful adjuncts. Any carbuncle or boils should not be interfered with surgically.

VI. ACUTE NEPHRITIS.

Acute idiopathic inflammation of the kidneys is undoubtedly a very rare affection in childhood, as is testified by the highest authorities on the diseases of children, both in this country and abroad: some even speak very doubtfully of its existence, and we cannot call to mind a single instance within our own observation. It is very different, however, with regard to nephritis occurring in the course of, or as a sequel to, other acute diseases; and especially to scarlet fever, which is, in fact, the great propagator of renal disease. We shall see hereafter that one of the most prominent and uniform symptoms of inflammation of the kidneys is the existence of albumen in the urine. It must not, however, be supposed that this fact is alone sufficient evidence of renal inflammation; on the contrary, we know that albuminuria may occur under a great variety of circumstances, the one prominent characteristic of most of them being the existence of some blood dyscrasia. For instance, in typhoid and typhus fever, intermittent fever, measles, small-pox, and diphtheria, albumen is very commonly found in the urine: it is met with also in some cases of heart disease, and in certain pulmonary affections; in all of these the symptom in question is due rather to mechanical causes affecting the renal circulation, than to any derangement of the circulating fluid itself.

In the idiopathic form of nephritis, the disease most likely occurs as the result of a chill, much in the same way as pneumonia is produced under similar circumstances. As a sequela to scarlet fever, the attack is also ushered in generally by cold, especially at the time when the skin is desquamating: it sometimes, though very rarely, occurs before that stage is reached, when the febrile disturbance is at its height, as a result of the blood-poisoning. Probably at least nine-tenths of the cases of acute nephritis which are met with in children, are produced in the convalescent stage of scarlet fever; we cannot therefore be too careful in the management of these cases, especially when we remember that in many of them, where a fatal result does not take place, a state of chronic albuminuria remains.

The *Symptoms* of acute nephritis, whether idiopathic or not, usually begin with a slight chill or rigor, followed speedily by the constitutional disturbance indicative of internal inflammation. These symptoms are, however, by no means severe at first, at least not as a general rule; the pulse is gradually quickened, the skin becomes hot, dry, and harsh; there is thirst, loss of appetite, headache, occasionally nausea, or even vomiting; and subsequently pain in the chest, a hacking cough, and disturbance of the respiratory rhythm. The occurrence of such symptoms, one, two, or, more rarely, three weeks after the scarlatina rash has begun to disappear, should always excite attention, especially if the progress of the disease has before been satisfactory. It is sometimes thought that renal disease is more apt to occur in mild than in severe cases; but if so, and the evidence seems certainly to indicate it, the explanation is we think to be found, not in the fact of the mildness of the attack, but rather in the greater carelessness after the mild than after the more severe cases, for it cannot be doubted that in the vast majority of cases where renal symptoms supervene it is from the want of proper care in the management of them.

In the course of a day or two after the appearance of the symptoms above mentioned, a marked change is observed both in the character and amount of urine voided; from having been perhaps rather copious in quantity, of pale colour, and clear, it becomes scanty, high coloured, and deposits a variable amount of sediment. The colour of the urine is often peculiar, having a dusky brown or "smoky" appearance, due to the presence of altered blood in it. When tested by being boiled, and with the addition of a little strong nitric acid, the presence of albumen is revealed by the formation of a flocculent deposit of varying amount, from a mere milky cloud or opaqueness to a quantity equal apparently to one-half of the whole solution.

With these symptoms, a swollen, puffy, and œdematous state of the body comes on; at first it is limited to the eyelids and face, but soon extends to other parts of the body, the feet and legs, and the areolar tissue generally; ultimately to the different serous cavities, and especially to that of the peritoneum. Here again the amount of anasarca varies greatly; it may be limited merely to the face, the other symptoms being proportionately mild, and all may pass off in a few days; or the dropsy may be general and severe: coincident with the other symptoms, the feverishness assumes a severe typhoid character. The amount of urine voided is, as a general rule, a fair test of the severity of the attack, and will vary in direct proportion to the dropsical swelling. Dr. West has alluded to the fact that occasionally, when dropsical effusion takes place into the pleura, it may occur so rapidly, that with the additional effusion into the pulmonary tissue, which almost invariably occurs in these cases, death may result so suddenly that scarcely any warning of its approach is given. Another complication is a rapid pneumonia. The state of the chest ought, therefore, always to be carefully watched in these cases.

Occasionally, though rarely, symptoms referable to the nervous system predominate, and convulsions may occur either at the onset of the attack if the inflammation be severe, or subsequently when the blood has become vitiated by the presence of urea and other constituents of the urine, owing to the non-elimination by the kidneys from suppression. Except in the case of uræmic poisoning, however, pure convulsive seizures seldom end mischievously, the great majority of the cases recovering.

We have already alluded to the fact that the urine in these cases of scarlatinal dropsy, the result of acute nephritis, always contains albumen in varying proportions: not only so, but the amount of urea is diminished, and when examined microscopically, numerous blood-corpuscles, cells of renal epithelium, and casts of the urinary tubes are found in greater or less abundance. The amount of blood present in the urine varies of course with the severity of the case, and is generally greater at the onset of the attack than subsequently, while the reverse obtains in regard to the tube-casts; at first, these are small pale casts containing blood cells in them; but subsequently they become somewhat larger, have fewer blood cells, and more of renal epithelium, while later still they may contain pus cells in addition.

In regard to the *Pathology*, the kidneys themselves at first are greatly congested, increased somewhat in size, darker in colour, and turgid with venous blood. This condition lasts during the acuteness of the attack, then it is that the uriniferous tubes become the seat of fibrinous deposits, which together with the epithelial lining of the tubes are cast off, and appear in the urine as fibrinous or epithelial tube-casts. As long as this takes place, and the tubes are cleared of these deposits, no further change is observable in the kidneys themselves; but this is seldom the case, for not only are the tubes themselves plugged up by deposits, but they sometimes rupture, and the vessels also undergo a degenerative action. In consequence of these changes, the kidney, already enlarged by the congestion, assumes a greyish mottled appearance, and, on section, the secreting or cortical portion is seen to be pale-greyish, granular, or waxy, while the tubular part maintains its dark-red colour. Sometimes the changes in the cortical substance are advanced so far, that it readily sears or breaks down under the finger. In what is called the third stage of the disease, the kidneys shrink so as greatly to diminish in size, the change taking place mostly in the cortical part, which thus becomes exceedingly thin, pale, and friable.

The *Treatment* of acute nephritis, whether it occurs idiopathically or as a sequela to scarlet fever, is pretty much the same in all cases, regard being had to the peculiar circumstances, constitutional or otherwise, of each case. We have previously said that nephritis almost invariably results from a chill, by which, owing to the correlative and compensating action of the skin and kidneys, any sudden arrest of the functions of the former, especially during the desquamative stage of scarlatina, is immediately felt by the latter, and the sudden afflux of blood, with at first increased functional activity, speedily leads to disorganization and consequent inflammatory action.

The first indication for treatment, therefore, is to endeavour to restore the function of the skin. The patient must be kept warm in bed, and in order to promote diaphoresis—which is of the greatest importance, not only as affording relief to the kidney by the quantity of water which may thus be removed, but also by diminishing the tendency to internal congestion—warm baths must be resorted to, and especially the hot-air or vapour bath : this is not only one of the most efficacious means of exciting perspiration ; but as it may be taken without the necessity of leaving the bed, for it may be applied under the bed-clothes, all risk of taking cold is avoided. To apply a hot-air bath without vapour, a small gas-stove is best; the heat from which should be carried by a pipe under the bed-clothes, the latter being raised from the patient so as to form a kind of chamber by means of a framework or cradle. The vapour bath may be extemporized, by placing a kettle upon the fire, the lid of which must be made to fit very tightly; a piece of india-rubber tubing is then to be fitted closely to the spout of the kettle, and the other end of the tube is to be carried under the bed-clothes, arranged as for the hot-air bath. As the water is kept gently boiling, the steam will make its way along the tube to the patient, and in a few minutes we may secure by either of these processes, but more freely and better we think by the latter, free diaphoresis. This may be repeated daily for a few minutes, as long as occasion requires, which may be judged of best by reference to the quantity of urine secreted, and to its character as regards the amount of albumen or blood present in it. The extent of the anasarca will also be an element of consideration.

There are of course other means of promoting diaphoresis, but unfortunately most of the medicines of this class have a very depressing effect as well, and that is to be deprecated. If, however, some stimulant be given at the same time, this tendency may be avoided; at any rate it is to be understood that diaphoresis stands first on the list of therapeutical agenda in the treatment of acute nephritis. Next in importance is the administration of purgatives, and here again a caution is required against the lowering influence of the remedies in question; moreover, in the selection of drugs for this purpose, those only should be given which are sure to promote watery evacuations. Of this class jalap is undoubtedly the best; and next to this some of the saline purgatives are of most value. It should be remembered that the object is not so much to keep up a continuous purgation—that would, indeed, be detrimental rather than otherwise: but so to adjust the dose, and to make such a selection of a drug, as to secure two or three watery actions daily. Further, it is very desirable to administer the purge early in the morning before any food is taken; by this means, only those indigestible portions of food which have remained in the bowel from the previous day will be cleared out, and no interference will be made with the subsequent meals, nor any hindrance to their proper digestion and assimilation. After the requisite amount of purging has been secured thus early in the day, with the distinct object in view of promoting a watery discharge, and thus to relieve the inflamed or congested kidneys, the diet should be very supporting, and of the most liberal kind, but always with the preference of the solid over liquid food, in consideration of the difficulty of getting the watery elements out of the body.

In expressing this opinion, we know that we are opposing the view put forward with much ingenuity by Dr. Dickinson, in a paper, read before the Medico-Chirurgical Society, in March, 1864, and approved by Dr. West; nevertheless we hold to the view above expressed, with the understanding that the treatment here recommended is carried out in its entirety.

The third indication is to apply so-called counter-irritants, or counter-stimulants, over the region of the kidneys; for this purpose mustard is the best; turpentine must be avoided owing to its specific action upon the kidneys, inflammation of those organs having sometimes resulted from the use of turpentine in this way. Dry cupping repeated every night is also a useful remedy: but the abstraction of blood by cupping or otherwise we strongly deprecate. The continued application of warmth and moisture in the shape of linseed poultices to the loins is valuable, especially in cases where the inflammation, judged by the pain in the loins and the scanty and highly albuminous urine, is severe.

Lastly, with reference to any particular medical treatment aiming directly at the kidneys themselves, we would remark that we are opposed to the administration of mercurials and antimonials, with a view to their alleged specific action in inflammation. On the other hand, we believe that we have seen much good result from the use of astringents, especially gallic acid, which seem undoubtedly to check the amount of blood and even albumen in the urine; the tincture of the sesquichloride of iron is similarly useful, and especially when the case is assuming a more chronic form. When the child is old enough to swallow a pill, say ten or fifteen years of age, we have seen great benefit result from the use of a pill composed of ⅛ grain of the extract of digitalis, 1 grain pil scillæ co. and ½ grain blue-pill, three times a day; this reduces the dropsy, increases the flow of urine, and apparently diminishes the amount of albumen in the urine.

The utmost care is necessary during the convalescent stage to avoid all exposure to cold. The child should be carefully and warmly clad, well fed, and if possible sea-air should be enjoined. Tonics, especially the chalybeate class, will also be required. Warm baths will be useful in promoting a healthy action of the skin, while at the same time avoiding the chances of cold.

VII. CANCER OF THE KIDNEY.

Cancer is probably the rarest form of renal disease. Dr. Walshe has collected forty cases of cancer of the kidney from different sources. In thirty-one of these, pure encephaloid—or one of its varieties—was the specific form of cancer observed, while there were only five cases of scirrhus. The disease affected both organs sixteen times, the right alone thirteen times, the left alone six. Out of thirty-one of the cases, two occurred in children under two years of age. The *Transactions of the Pathological Society of London*, for 1847, contains the report of a case of cancer of the kidneys ending fatally at the age of thirteen months; in which, after death, the weight of the two kidneys was found to amount to five pounds. Cancerous degeneration, like other forms of renal disease, commences usually in the cortical substance, and thence extends to the medullary cones and to the walls of the pelvis and ureters.

The *Symptoms* are often insignificant: the chief are pain, increase in size of kidney, which may be felt through the abdominal walls, hæmaturia, and possibly the passage of urine containing pus and encephaloid pulp.

The *Treatment* must consist in palliating the effects of the disease, in relieving pain by fomentations and sedatives, and in supporting the strength.

VIII. DISEASES OF THE GENITAL ORGANS.

A. *In the Male.*

1. Discharge from the Male Urethra.—Boys occasionally suffer from a kind of leucorrhœal discharge from the urethra, which is however more rare than the leucorrhœa of female children, probably because the mucous membrane of the male genital organs is less extensive, and is better protected against the irritating influence of external agents than is that of girls.

The *Treatment* of these cases consists in the use of the warm hip bath, the application of bread and-water poultices when the morbid action runs high, saline purgatives, and great cleanliness. The parents should be cautioned as to the infectious nature of the discharge, and the risk of ophthalmia from its contact with the eye.

2. HYDROCELE.—As we shall hereafter speak of *congenital hydrocele*—in Part IV., Chapter II.—it is only necessary to mention that simple hydrocele sometimes occurs in infants only one or two months old, giving rise to feelings of alarm on the part of the parents. It is, however, generally to be cured by the application of cold or slightly stimulating lotions, or by simply painting the scrotum three or four times with the tincture of iodine. Should these means fail to procure absorption, the hydrocele may be punctured with a fine trochar, and the fluid allowed to drain away.

3. ACUTE TESTITIS.—Inflammation of the testicle—orchitis—is rare in young children, but it does sometimes occur. The symptoms are generally acute, and the swelling considerable; but the disease soon subsides, and is usually confined to one gland. Mr. Curling relates the following example:—A Jew child, only five months old, was brought to the London Hospital on account of a swelling in the left groin and scrotum. The mother first observed it the day before on washing the child; he afterwards cried the greater part of the night. The tumour extended from the external ring to the bottom of the scrotum, was fully six times the size of the right testicle, felt firm and hard, and received no impulse when the child cried or struggled. The scrotum was distended, very red and hot. The application of a leech and cold lotion was ordered, and two drachms of castor-oil were given. In two days the swelling was reduced to about one-third, and was much less tender: the infant also appeared to be free from suffering. Four grains of the hydrargyrum cum cretâ were ordered to be given every night. Under this treatment the swelling and induration soon subsided, and in a week the gland was nearly reduced to the size of the right testicle, but the cord still remained thickened and hard. Three weeks after the attack first commenced, the parts were found to be perfectly natural.

B. *In the Female.*

1. INFANTILE LEUCORRHŒA.—Female children of all ages, and especially those of a strumous or scrofulous taint, are liable to a discharge from the mucous glands of the vulva, which occasionally becomes very profuse, purulent or muco-purulent, and sometimes fœtid, but generally without any heat or pain during micturition, though often with a good deal of excoriation of the surrounding parts. Bouchat considers that the affection is generally due to herpetism or herpetic diathesis, scrofulism and dirtiness. He adds to these masturbation, and oxyurides of the rectum. Great care

should be taken not to mistake this disease for gonorrhœa produced by infection, a mistake which has frequently been made, causing great distress and anxiety, and perhaps ruin to an innocent person. Happily there are some very distinct diagnostic signs by which the error may be avoided. Thus, in gonorrhœa the discharge is usually faint, of a greenish-yellow colour, very thick, and purulent, the parts highly inflamed and swollen, the inflammation involving not only the labia but the parts about the meatus, and extending beyond the hymen high up into the vagina; the discharge also comes from the entire vaginal tract. In the simple form of infantile leucorrhœa, on the contrary, there is generally little or no swelling; the inflammation is limited to the vulva, whence also the discharge comes, the vagina itself being perfectly free and healthy. In gonorrhœa micturition is always painful. It is rarely so in simple leucorrhœa. Moreover, in the former, there will probably be evidence of injury and the hymen gone. In the latter, neither of these.

It must, however, be admitted that in some instances the inflammation is so intense that the appearances very much resemble those caused by violence, while yet the circumstances make it impossible for anything of the kind to have taken place. The history must therefore in all cases be thoroughly inquired into. The peculiarity of the child's constitution will often throw light on the nature of the discharge, inasmuch as strumous subjects are especially apt to be affected with this form of leucorrhœa; particularly during the period of dentition, or if they suffer from neglect of cleanliness, or from the irritation of ascarides in the rectum, or from constitutional debility. Occasionally the discharge seems to prevail as an epidemic, and it has been observed frequently after the occurrence of certain eruptive fevers. The virus is highly contagious, and its application to the eye gives rise to violent ophthalmia.

It has been doubted whether the discharge is communicable from the child to the adult male or female; for unfortunately cases of infantile leucorrhœa have led to false accusations, and much misery. After the occurrence of an important trial in the Dublin law courts some years ago, Mr. Wilde examined the question with great skill; and from his investigations there can now be no doubt that the answer must be in the affirmative. This case is reported in the *Medical Times and Gazette* for January 17, 1857.

The *Treatment* of infantile leucorrhœa must be perseveringly carried out, for the disease will frequently last for months. Attention to cleanliness, frequent sponging with an astringent lotion, the common goulard water is as good as any, or a lotion of sulphate of zinc or alum, four or five grains to the ounce, the use of cold hip baths containing a little alum, and mild alteratives or laxatives will be needed. Of all these, there is nothing so absolutely necessary as cleanliness; without it, all treatment will be useless. The earlier the disease is discovered the better, and in its first stage the constant use of tepid or cold water, with a wet compress laid upon the vulva, will frequently cut it short and may even effect a cure. If ascarides are known to be present, these must at once be treated by enemata of salt and water, or quassia infusion; a dose of scammony may be necessary. In cases of long standing which have resisted all efforts, one or two applications with a camel's-hair brush of a solution of nitrate of silver, twenty grains to the ounce, will sometimes complete the cure, though at first the application will be very painful, and for a time the discharge may be more purulent and in greater quantity. The diet should be plain but nourishing, and tonics, especially quinine and steel, will be useful. Sometimes when the local inflammation is severe and the urine irritating, the use of alkalies, and especially the acetate of potash, will be of service. It should also be remembered, that in the great majority of cases the disease is after all but a local manifestation of a general condition, and that a strumous constitution is what we have really to treat; bearing this in mind, cod-liver oil and the syrup of the iodide of iron will do good service. If all these measures fail and the discharge proves obstinate, a short residence at the sea-side with sea-bathing will often suffice to cure it.

2. Cohesion of the Labia.—After inflammation of the vaginal labia, the contiguous surfaces have sometimes been found adherent; the adhesions perhaps being due to the organization of the lymph which has been effused. The only *Treatment* required will be the separation of the labia by a probe, or if necessary by a bistoury; the edges of the wound must be kept apart by oiled lint, until cicatrization has taken place.

CHAPTER VI.

DISEASES OF THE SKIN.

I. CLASSIFICATION.

It is an opinion very generally entertained by medical practitioners, that the subject of cutaneous pathology ought to be viewed as a distinct branch of medicine: since it is not only thought that the diagnosis of cutaneous diseases is extremely difficult, but also that the treatment of these affections requires a special study. We believe that such ideas are very erroneous and mischievous; the various phenomena presented by each class of these disorders being generally strikingly characteristic and always appreciable by the eye, while their treatment is by no means difficult in the majority of cases, and often remarkably simple. Moreover, it must be remembered that the greater number of cutaneous affections are very common, very irritating, and very unsightly; and that, speaking generally, they are merely local manifestations of a constitutional disorder. How then can he be a sound or successful practitioner of medicine who is not fully acquainted with them in all their bearings?

In dealing with the symptoms, diagnosis, and treatment of these diseases, it is necessary to adopt some classification: for although all such classifications are entirely artificial, like the Linnæan classification of the vegetable kingdom, yet they cannot be discarded. The systematic arrangement which it is proposed to follow in these pages is that of Willan, considerably modified; and as infants and children are liable to the same skin diseases as adults, this chapter must contain an account of them all, at the same time that the description is qualified so as to apply specially to these affections as they occur in early life.

As the eruptions of the acute or zymotic diseases have been fully described in treating of that group of maladies (*vide* p. 106, *et seq.*) it is unnecessary to further refer to them in this portion of the work, or to collect them together into a special order.

Order 1. *Erythematous Eruptions.*—The diseases of this group are characterized by the appearance of variously formed superficial red patches, varying in intensity and size, disappearing transiently under pressure, and terminating in resolution or desquamation. They are frequently complicated with gastro-intestinal irritation or inflammation, and with cerebral or pulmonary diseases. This order includes Erythema, Erysipelas, Roseola, and Urticaria.

Order 2. *Papular Eruptions.*—A papule or pimple is a small, solid, acuminated elevation on the skin, resembling an enlarged papilla; generally terminating in resolution, or in slight desquamation, and sometimes in ulceration of its summit. Pimples may be of different kinds: either solid lymph deposits in the skin, or elevations caused by effusion of fluid, in which case they are the early stage of vesicles or congested and erected follicles, or enlarged papillæ, or distended sebaceous glands. The first of these are the true papules, and in the affections in which they occur they are usually preceded by itching; are rarely accompanied by fever; they develop slowly; are not contagious; appear on any part of the body; and vary in their duration from a week to several months. Lichen, Strophulus, and Prurigo are the diseases of this class.

ORDER 3. *Vesicular Eruptions.*—A vesicle is a slight elevation of the epidermis, containing a serous fluid, which is generally transparent, but occasionally opaque or sero-purulent. The fluid may be absorbed; or it may become effused upon the surface, causing excoriation and small thin scabs or incrustations. Vesicular eruptions are occasionally preceded by fever, but often appear imperceptibly; they give rise to a peculiar appearance, as if drops of water had been scattered over the surface of the skin. In this order are placed Sudamina, Herpes, and Eczema.

ORDER 4. *Bullous Eruptions.*—As a general rule, bullæ differ from vesiculæ merely in being larger, and hence it is almost unnecessary to separate them into two orders: they are superficial blisters, varying in size from a quarter of an inch to two or three inches, and are produced by effusions of serum beneath the epidermis. Pemphigus and Rupia are the two eruptions which come under this class according to Willan, but rupia is now ranked by dermatologists with the syphilodermata.

ORDER 5. *Pustular Eruptions.*—The pustular affections of the skin are characterized by the formation, between the cuticle and cutis vera, of small tumours called pustules, containing purulent fluid. Three kinds of pustules are sometimes spoken of by authors—viz., *psydraciæ*, or such as are small, irregularly circumscribed, and but slightly elevated above the skin; *phlyzaciæ*, or those which are of some size, elevated, have inflamed bases, and end in small brown scabs; and *achores*, or such as are small, have comparatively large inflamed bases, and form thick large scabs which somewhat resemble incrustations of honey. The genera of this order are Ecthyma, Impetigo, and Equinia.

ORDER 6. *Parasitic Eruptions.*—The order Parasitici must be divided into two groups, according as the parasite belongs to the vegetable or animal kingdom. The cutaneous diseases depending on a parasitic plant are, Tinea Tonsurans, Tinea Kerion, Tinea Circinata or ringworm of the surface, Tinea Favosa, Tinea Decalvans, Tinea Sycosis, Plica Polonica, and Tinea Versicolor or Chloasma; while the chief diseases produced by parasitic insects are Scabies and Phthiriasis. All are contagious.

ORDER 7. *Squamous Eruptions.*—The term squamma is applied to the scales of degenerated, thickened, opaque, dry epidermis which cover minute papular elevations of the skin: they are readily detached, and are reproduced by successive desquamations for a length of time. The scales or scurf are the result of a morbid secretion of the epidermis: their formation gives rise to merely slight constitutional disturbance, and to local heat and troublesome itching. None of the squamous diseases are contagious, but they are very chronic in their duration. Lepra or Psoriasis, Pityriasis, and Ichthyosis are the diseases included in this order.

ORDER 8. *Tubercular Eruptions.*—This order is divided into the following genera:—Elephantiasis, Molluscum, Acne, Lupus, Cancer, Framboesia, and Keloid. These affections are characterized by the formation of small hard tumours or tubercles, more or less prominent, circumscribed in form, and persistent: the tumours may become ulcerated at the summit, or they may terminate in suppuration. Tubercular diseases are slowly developed, are very chronic, are more severe in tropical than temperate climates, and their symptoms are so characteristic that their diagnosis is easy.

ORDER 9. *Hæmorrhagic Eruptions.*—In this order the chief feature is the presence of crimson spots of variable size, caused by the rupture of capillary vessels: hence, as the blood is extravasated, the redness is unaffected by pressure. When the hæmorrhagic spots are very small they are termed *petechiæ;* when large, *vibices* or *ecchymoses.* Two diseases belong to this class—viz., Purpura and Scurvy.

ORDER 10. *Maculæ.*—This order of cutaneous disease is characterized by certain changes of colour in parts of the skin—giving rise to spots of various appearance and size—or in the whole of the cutaneous envelope. The maculæ are seated in the rete mucosum, and depend on some alteration of its colouring matter: they are generally incurable, and unattended by any derangement of health. They may be divided into two classes: those attended by *change* of colour—Nigrities, Lentigo, Ephelis; and those marked by *absence* of colour—Albinismus and Leucoderma.

II. ERYTHEMATA.

1. ERYTHEMA is a non-contagious, superficial inflammation of the skin; characterized by slight red patches of variable form and extent, and most frequently seen on the face, chest, and extremities. Its duration varies from a week to a fortnight: it is seldom preceded or accompanied by febrile symptoms: it causes but little local heat, and no pain: it terminates by slight exfoliation of the epidermis: and the prognosis is always favourable.

Species.—There are several varieties of erythema; they may be divided into two groups—the one, A, idiopathic or local, including *Erythema simplex,* the result of the application of external irritants;

E. intertrigo, the redness induced by the friction or chafing of one surface upon another, often met with in the axillæ, groins, and between the buttocks of infants who are not kept clean and dry, and *E. læve,* the redness that follows the distension of the skin in dropsy, and *E. paratrimma,* the blush that precedes a bedsore—the other, group B, symptomatic, includes *E. papulatum, E. tuberculatum, E. nodosum, E. fugax,* and *E. marginatum,* dependent upon some constitutional disorder. In *E. fugax,* the red patches are evanescent and fleeting, subsiding at one part to break forth in another, and producing heat and dryness of the surface. It is symptomatic of some visceral derangement. *E. marginatum* consists of well defined patches of redness; if the centre of the patches is pale, we have *E. circinatum.* These two varieties are mostly early stages of *Tinea circinata* or *Tinea versicolor.* The other forms of Erythema are merely degrees of one and the same thing, in which there is more or less exudation into the skin. Hebra includes all these symptomatic forms of Erythema under the head of *E. multiforme.* In *E. nodosum* the eruption is mostly confined to the fore part of the leg, taking the form of one or more large oval patches running parallel to the tibia, and rising into painful protuberances, much resembling nodes, and giving the idea of an intending suppuration; but these enlargements never suppurate. It occurs commonly in young women when badly nourished or overworked.

Treatment.—This is very simple. A few doses of some mild saline aperient; warm baths; attention to the digestive organs; light diet; and tonics, especially quinine, or the compound tincture of bark, or the mineral acids, are sufficient, as far as concerns internal remedies, for the cure of all forms of this affection. With regard to local measures, absorbent powders in the case of the local, and alkaline baths in that of the symptomatic varieties, may be employed. If itching is troublesome, a lotion of oxide of zinc and prussic acid may be used with benefit.

2. ERYSIPELAS—popularly called in Scotland the *rose,* in this country *St. Anthony's fire*—is a diffused inflammatory affection of the skin, and very commonly of the areolar tissue. It is characterized by the affected part becoming of a deep-red colour, hot, painful, and swollen. No portion of the surface is exempt from its attacks; the integuments of the face and head, however, are most commonly the seats of *idiopathic* erysipelas—that which arises from internal causes; while *traumatic* erysipelas—that which follows a wound—may occur on any part.

Symptoms.—Idiopathic erysipelas resembles the eruptive fevers, inasmuch as it is preceded by fever and general constitutional disturbance. It often sets in with chilliness, followed by distinct rigors; sore throat is an early and frequent accompaniment of it: there is great mental depression; disturbance of the cerebral functions; and nausea, vomiting, and diarrhœa may also be present.

Then, on the second or third morning from the rigor, redness and swelling appear on some part of the skin, frequently on one side of the nose, spreading to the rest of the face, and often extending over the scalp, neck, and shoulders. The lips swell, the cheeks enlarge, the eyes become closed by their puffy lids, and all trace of the natural features is completely lost: while there is frequently great fever and debility, with very weak pulse, brown and dry tongue, and low muttering delirium. After three or four days the redness fades, the swelling subsides, and the cuticle desquamates. In most cases the inflammation is merely superficial; occasionally it affects the subcutaneous areolar tissue—*phlegmonous erysipelas*—and is then apt to be followed by suppuration and sloughing.

Terminations.—Erysipelas may prove fatal by the extension of the inflammation to the brain or its membranes, giving rise to effusion and coma. The same result may occur from the mucous membrane of the glottis becoming affected, so that the chink gets closed, and the patient dies unexpectedly from suffocation. In other cases death is owing to failure of the vital powers.

Causes.—Erysipelas may arise from contagion. When it prevails epidemically, as it sometimes does, insufficient food, foul air, and trifling injuries favour its occurrence.

Treatment.—This must be conducted on the principle that we cannot cut short the disorder, but only lead it to a safe termination. At the commencement an active purgative, such as a dose of the neutral salts, will be beneficial; and when the tongue is much coated and the breath foul, an emetic does good. In the cases which have come under our notice, there has always been marked evidence of debility, and we have consequently followed the practice of those physicians who adopt a tonic mode of treatment as the great rule in idiopathic erysipelas. The late Dr. Robert Williams, of St. Thomas's Hospital, gave all his adult erysipelatous patients milk diet, sago, very gentle purgatives, and from four to six ounces of port wine daily, from the very first appearance of the disease, irrespective of the symptoms or the part affected; and he says in his admirable work on Morbid Poisons, "I have pursued this system for several years, and I hardly remember a case in which it has not been successful." The carbonate of ammonia, in doses of one to five grains according to the age, will often prove an excellent substitute for wine; or it may be administered alternately with wine every three or four hours. Tincture of steel in half drachm doses every two hours or so, is a favourite plan of treatment with some practitioners.

Of all the local applications which have been recommended, that which gives the most relief is the fomentation by flannels wrung out of a hot decoction of poppy-heads, assiduously applied. Linseed-meal poultices are sometimes useful; flour freely dusted over the inflamed part has often a soothing cooling effect in mild cases, but as it imbibes the cutaneous transpiration it is apt to form a crust which is removed with pain and difficulty; and sedative lotions, or water dressing—the temperature being regulated by the feelings of the patient—are frequently of much service. In mild cases, covering the affected parts with cotton-wool will be found an effectual topical remedy.

In the phlegmonous form of the disease, when suppuration has taken place, and pus has become infiltrated through the areolar tissue, free incisions must be made to give it exit.

Infantile erysipelas most frequently occurs about the region of the umbilicus, whence it may extend over the entire surface of the abdomen. It may be caused by some mismanagement of the remains of the funis. The strength must be supported: if the mother's milk be deficient in quantity or quality, a vigorous wet-nurse should be obtained. Cordials, as white-wine whey, wine and water, &c., should also be given.

3. ROSEOLA is a mild, non-contagious inflammation of the skin, characterized by rose-coloured spots or transient patches of redness, of small size and irregular form, distributed over more or less of the surface of the body; its duration varies from twenty-four hours to six or seven days. The eruption, at first brightly red, gradually subsides into a deep roseate hue, and slowly disappears. It is accompanied by slight fever.

There are two groups of roseola—the one, *idiopathic*, including *R. infantilis*, *æstiva*, *autumnalis*, *annulata*; the other, *symptomatic*, including the rosy rashes seen in connection with variola, vaccinia, miliary fever, rheumatism, cholera, and fever. The former group need only be noticed in detail.

R. infantilis—which, from the resemblance of its rash to rubeola, is commonly known as *false measles*—attacks young children, especially in hot weather. It runs an irregular course. It may be distinguished by the constitutional disturbance being very slight, by the absence of catarrhal symptoms, by the eruption being confined to one limb, or to one portion of the trunk; and by the absence of that crescentic arrangement of the spots usually present in measles. *R. æstiva* is the name given to the roseola which occurs in summer about the face, neck, and trunk, and *R. autumnalis* to that form of rash which occcurs about the legs in autumn, generally in circular patches of a dark hue and about half an inch in diameter.

But little *Treatment* is usually necessary. Simple diet, diluents, and a few warm baths, are often all that is required; perhaps mild alteratives, laxatives, and tonics may be needed in some few cases. Locally, oxide of zinc lotion is most serviceable.

4. URTICARIA.—*Urticaria*, or *nettle-rash*, is a transient and non-contagious erythematous eruption; characterized by long prominent patches or wheals, either red or white, of irregular shape, and of an evanescent character. The spots or wheals closely resemble those produced by handling nettles. It is accompanied by intense heat; a burning and tingling in the affected spots, with great itching;

and it is often associated with more or less irritation of the gastro-pulmonary mucous membrane, and fever.

There are two varieties: in one the disease is acute, *urticaria febrilis*, running a short rapid course, and due in almost all cases to some error of diet, hence the term *U. ab ingestis*. Shell fish, fruit, pork, tea, pepper, often evoke it under certain conditions. Another variety, which is chronic, *U. chronica*, is very obstinate, and either persistent or intermittent. Both forms attack individuals of all ages and constitutions. The acute form may come on with very severe pyrexia, vomiting, and headache, relieved by the development of the eruption, which may attack the face and give rise to considerable puffiness. Chronic urticaria may be associated with a variety of diseases in which the skin is irritated and scratched, as in scabies, pediculosis, or phthiriasis as it is often called; and in connection with lichenous eruptions in children, constituting so called lichen urticatus, which in many cases is primarily due to an uncleanly and inactive skin. In other cases, it seems to be associated with some internal disorder, such as uterine irritation.

Urticaria is also excited through reflex action by the irritation of dentition; by pulmonary irritation; by exposure to cold or heat; and by peculiar derangements of the digestive organs, arising from the use of improper food.

Treatment.—This must consist, in the case of acute urticaria, in the administration of emetics and purgatives, followed by alkalies, where the disease depends upon stomach derangement. In the chronic form, a simple diet, without stimulants of any kind must be rigidly adopted, laxatives, antacids, quinine, and warm or tepid baths, forming the remaining chief remedies. In the acute form, much benefit has been derived from painting the skin with a weak solution of sulphate of copper.

III. PAPULÆ.

1. LICHEN.—This is a papular affection, readily recognized by the minute hard red elevations of the skin which it presents, together with the annoying pruritus. There are three forms usually seen in this country:—

Lichen simplex, in which the eruption consists of small agglomerated papulæ, rarely larger than a millet seed.

Lichen strophulus, or *red gum*, *tooth-rash*, *&c.*, which generally attacks infants at the breast; and is characterized by an eruption of minute, hard, sometimes slightly-red pimples, attended with itching, and appearing upon part or the whole surface of the body.

And *Lichen agrius*, in which the papulæ are more inflamed, and developed on an erythematous surface, which appears hot and painfully distended. The itching is very intense, and the duration of this form is often very prolonged.

Hebra has described two other forms, *Lichen rubra* and *L. scrofulosum*, but these are very uncommon in England.

Treatment.—Tepid baths, mild laxatives, and acidulous drinks will cure most forms of lichen. The irritation is best relieved by a weak lotion of the liquor plumbi subacetatis, to which a little hydrocyanic acid may be added, and alkaline baths.

2. PRURIGO.—*Prurigo—itching*—is a cutaneous disease characterized by disordered sensation, atrophy of the epidermis and an eruption of small papulæ or pimples, of the natural colour of the skin. It is a chronic affection, lasting for months or years, and causing great discomfort, not to say misery. Patients affected with it scratch and tear themselves constantly till the blood flows; their sufferings are aggravated by warmth. Willan describes three varieties—*prurigo mitis, prurigo formicans*, and *prurigo senilis*. The first is the mildest form; in the second, the itching is combined with a sensation like the creeping of ants or the stinging of insects; while the third occurs in old persons, and is the most obstinate, often continuing for the rest of the patient's life. It may be associated with the presence of lice, but not necessarily.

Diagnosis.—The itching and eruption arising from prurigo must not be confounded with the disease phthiriasis, caused by parasitic insects. We may here mention that the human body is infested with four kinds of lice—viz., the *Pediculus vestimenti*, or *clothes louse;* the *Pediculus capitis*, or *head louse*, which lives in the hair; *Pediculus ciliorum*, or *louse of the eyebrows;* and the *Pediculus pubis*, or *crab louse*, which infests the hair of the pubes. They are all destroyed by mercurial ointment, or by dusting the parts with calomel, or washing with infusion of tobacco. Lice inflict wounds upon the skin and induce irritation, for the relief of which scratching is practised, so that the skin is torn by the fingers very freely, and if the patient be badly nourished, ecthyma will be caused. Urticaria, impetigo, and even eczema may be evoked by lice.

Treatment—Alkaline, or sulphur, or plain water baths should be used daily; the temperature should not exceed 70° Fah. The local applications which give the most relief are vinegar, lime-water, a weak solution of bichloride of mercury, a dilute solution of creasote, a lotion containing prussic acid, unguentum picis, or an ointment containing a small quantity of aconitine, &c.

The general treatment must consist of a light and cooling regimen, the avoidance of stimulating food or drink, and the use of laxatives, sarsaparilla, acid tonics, or even the liquor potassæ arsenitis.

Dr. Bowling, of Kentucky, says, in a letter to Sir T. Watson, that he has cured numerous cases of prurigo senilis thus:—"I direct that the affected parts be sponged for a minute or so with good apple-vinegar, and then be allowed time to dry. After this they are to be *smeared* over with citrine ointment (*unguentum hydrargyri nitratis*). The applications are to be made twice a day. The cure is usually effected in a week."

IV. VESICULÆ.

1. SUDAMINA.—In the progress of many acute and chronic diseases attended with sweating, crops of small transparent vesicles make their appearance. Thus in acute rheumatism, typhoid fever, &c., sudamina are frequently found upon the trunk and extremities, especially in the latter stages of these affections.

Some persons speak of *Miliaria* as a distinct fever arising from constitutional causes, and as differing from *sudamina* produced by copious sweating. The distinction—if it exists—is unimportant; since the vesicles in both cases resemble each other, and disappear spontaneously without requiring any treatment.

2. HERPES.—*Herpes* or *tetter*, is a transient, non-contagious affection, consisting of clusters of globular vesicles upon inflamed patches of irregular size and form. The eruption runs a definite course, rarely continuing for more than two or three weeks; it is not usually severe, nor is it accompanied by any constitutional symptoms. The commonest example met with occurs about the face in connection with an attack of catarrh. Care must be taken not to mistake its nature, since *herpes præputialis* has been actively treated as syphilis. A singular species of this disease is known as *herpes zoster*, or *zona*, or the *shingles*, in which the inflamed patches with their clustered vesicles are arranged in the form of a band, encircling half the circumference of the body, or one side of the face or the neck; in the majority of cases the zone will be found to occupy the right side of the body. The unilateral distribution of the eruption attended frequently with severe pain, which is relieved by the development of the rash, is characteristic of the affection. The shingles does not consist of a continuous but an interrupted band of eruption, which is successive; that is to say, some groups of vesicles are older than others, so that different stages of disease are noticed in one and the same subject. After a while the vesicles give rise to flat dark scabs, and some pitting may be left behind after the eruption. Neuralgia may be troublesome, both after as well as before the occurrence of eruption.

Treatment.—Gentle laxatives, warm baths, and a plain unstimulating diet are indicated. The local irritation should be relieved by an emollient lotion, or by the application of the zinc ointment, or the subacetate of lead cerate of the Pharmacopœia. In the case of shingles, the eruption should be well protected from injury. Absorbent powders or collodion may be applied to the vesicles, and a layer of cotton wool be used to protect the parts, and to exclude the air. Quinine should be given in large doses.

3. ECZEMA.—*Eczema, crusta lactea, humid tetter*, or *scall*, is a non-contagious disease, often consisting of an eruption of small vesicles on various parts of the skin, closely crowded together, and often running into each other, so as to form, on being ruptured,

superficial moist excoriations, which give exit to a peculiar discharge, that stiffens linen and dries into thin yellow crusts.

Species.—There are several species of this disease. When the eruption consists of minute vesicles on different parts of the skin, without any inflammation, it is called *eczema simplex;* when the skin is inflamed, and there are heat and swelling, *eczema rubrum. Eczema impetiginoides* is a severe form of eczema, in which there is a tendency to the early and free formation of pus. When arising, as it sometimes does, from the effect of great heat, especially from the heat of the sun, it is called *eczema solare;* but this is really *E simplex.* When the eruption occurs as a result of the use of mercury, *eczema mercuriale.*

But the form of this eruption which most concerns us now is that known as *eczema infantile;* inasmuch as infants at the breast and young children are peculiarly subject to it. This variety we shall now describe.

Eczema infantile.—This variety, like eczema adultorum, originates in mal-assimilation, and is often due to a faulty secretion of milk on the part of the mother. When it once attacks an infant, it gives rise to the greatest trouble. The general health also is likely to be greatly affected by the cause of the disorder, as well as by the intense itching and burning heat of skin which accompanies it; and the sufferer becomes pale, weak, anæmic, and emaciated. The form of eczema which is seen in *E. infantile* is a mixture of *E. rubrum* and *E. impetiginoides.* The state of *eczema simplex* is only seen occasionally; the disease begins in itchy red patches, which soon discharge a fluid excoriating the parts around, whilst the deeper tissues themselves become inflamed and swollen. The free discharge, drying, yields abundant crusts of a yellow colour, since it is more or less purulent in character; indeed its morbid secretion, from being a transparent and colourless ichor, like water in appearance, soon becomes slightly opaque (tinea mucosa), milky, then yellowish and semi-purulent, and the case is transformed into *eczema impetiginoides;* or the discharge may take on a still more decidedly purulent character, while small pustules are developed on the red and tumefied skin around the patch, and then the case is one of *impetigo.* Thus, says Mr. Wilson, the plus or minus of these pathological conditions is irrespective of the cause or essential nature of the disease; in other words, the disease being the same, it may, according to the temperament or constitution of the child, be an erythema verging upon eczema; an eczema rubrum; an eczema verging on impetigo; or eczema impetiginoides; or, the pustular element being in excess, it may be an impetigo. The aspect of the disease may vary in different parts of the body, now being slight here, now discharging there, now crusting here, and so on.

Sometimes the whole of the body, from head to foot, is covered with these eruptions; the excoriations and scabs being most irritating, and the ichorous discharge from them disgustingly offensive.

The hair also becomes matted and entangled with friable crusts resembling particles of mortar; the ears are swollen; the face is bloated; the features are distorted by the discoloured scabs, which sometimes form a huge, unsightly mask; the glands are enlarged; and the child becomes worn out and exhausted with the agony it experiences. Occasionally the danger is increased by the occurrence of diarrhœa; or of congestion or inflammation of the mucous membrane of the air-tubes, lungs, &c. It has been noticed that in many cases of extensive and long-continued eczema, the affection has been succeeded by an attack of asthma, only to be eradicated by the cure of the eczema We can submit no reason for the seeming interdependence of the two diseases.

Treatment.—In attempting to cure eczema infantile—as also, indeed, the other obstinate varieties of this disease—the two main indications to be fulfilled are the improvement of the general health and the soothing of the locally inflamed part.

Sometimes it is necessary, before attempting these two objects, to give alteratives to correct disordered digestion or sluggish action of the excretory organs; the object being to stimulate the liver, and to obtain a perfect clearance of the stomach and bowels. Some recommend calomel, the dose being repeated—according to circumstances—once, twice, or thrice a week, as the patient's condition may indicate; but rhubarb and soda or magnesia may be equally relied upon. Occasionally alkalies will relieve derangement of the stomach, which shows itself by flatulence, disordered bowels, and loaded urine.

To *alleviate the local distress*, the routine treatment is the use of the benzoated oxide of zinc ointment, rubbed down with spirits of wine—F. 183—which may be freely and gently applied over every part of the eruption, night and morning. Where the eruption is chiefly confined to the arms or legs, linen sleeves may be used to keep it applied to the diseased surface. On the face no other covering than the ointment is necessary, but the latter should therefore be used the more freely.

When the oxide of zinc ointment is thus employed, the formation of crusts from the discharge may be prevented, in consequence of the exclusion of the atmosphere and the resulting absence of dessication. When crusts are already formed, the object to be attained is to soften them by saturating them thoroughly with the ointment, and then by gentle friction to displace them and to substitute a thin stratum of the ointment. The inflamed skin is not to be washed; but the exudations are to be gently removed with a soft napkin. On the scalp, the ointment should be applied in the direction of the hair to avoid matting; and as soon as the oozing of ichorous discharge has somewhat subsided, the hair should be gently brushed. But a preferable mode of applying zinc is to paint on with a camel's-hair brush a lotion made of half an ounce of finely powdered calamine powder—not the gritty powder usually sold—half an ounce of oxide of zinc, two drachms of glycerine, and eight ounces of rose-water: this lotion should be put on several times a day, and the surface cleansed with thin gruel every night. When the eczema becomes dry and scaly, in addition to the lotion, an ointment composed of a grain of white precipitate to an ounce of lard may be smeared on at night with great benefit. When the crusts from the discharge have been allowed to dry, we recommend the use of linseed-meal poultices, especially if the scalp be involved. In the latter case, the hair should be removed, the poultice applied, and the whole covered with an oil-skin cap. The poultice should be renewed during the day and at bedtime. Between each change, the parts should be well washed with soft soap and warm water, and to prevent the poultice adhering, it should be enclosed in a piece of rag which should be burnt after being used. The crusts soon fall off, and leave a red-clean surface. We then apply, night and morning, washing the parts between the dressings, the ointment of ammoniated mercury. When the crusts are on the face, they are readily removed by fomentations of warm water. Chronic eczema is best treated by a glycerate of the sub-acetate of lead.

The improvement of the general health is fulfilled by correcting the mal-assimilation, and restoring the blood to its normal condition. The chief agent for effecting this is cod-liver oil; iron is also most useful in the form of steel wine; arsenic is sometimes an effective and harmless remedy for the youngest infant. The dose of Fowler's solution, for an infant from six months to a year old, is half a minim thrice daily. In many cases it may be beneficially conjoined with iron, cod-liver oil, &c.:—F. 23, 24. Should diarrhœa, or inflammation of either of the mucous tracts supervene, the use of the arsenic must be suspended. The diet of the child must be wholesome and nutritious; good milk in large quantity, chicken broth, light puddings, and good beef-tea, &c., being very valuable.

V. BULLÆ.

1. PEMPHIGUS.—This affection is characterized by the appearance of large bullæ, often one or two inches in diameter, upon one or more regions of the body. The eruption is generally preceded for twenty-four or forty-eight hours by slight general indisposition, fever, and itching of the skin; small red circular patches then form, gradually increase in extent, and become covered with bullæ, which either fade away on attaining their full size, or burst, and are replaced by thin brownish-coloured incrustations. The duration of this disease is usually from one to three weeks, although it occasionally becomes chronic and prolonged for months.

Young infants, particularly such as are brought up in the dirty, ill-ventilated dwellings of the poor, sometimes suffer severely from this disease in an acute form. But it is not unlikely that the disease is in reality, in some of these instances, an erysipelas, which is accompanied by the rapid development of phlyctenæ, and proving speedily fatal. A chronic form of pemphigus sometimes occurs in children under six months of age, as an element of congenital or hereditary syphilis. The bullæ in this case attack the hands and feet as well as other parts, and is accompanied by other general and local signs of the syphilitic infection. Faloy states that benign pemphigus is generally apyretic, epidemic, and contagious to the mother; is not inoculable; and is evoked by excessive heat. Bohn corroborates the last statement by affirming that the affection is often due to nurses and midwives carelessly bathing the infant in water at too high a temperature.

2. POMPHOLYX is the name given to the variety of pemphigus which is unattended with fever and exhibits few bullæ. It is quite unnecessary to constitute this a variety of pemphigus. It runs its course in about eight or ten days.

Treatment.—Tonic and alterative medicines, quinine and arsenic, warm bathing, with generous diet and fresh air, appear to be the remedies called for in pemphigus. In the syphilitic variety mercury is indicated.

3. RUPIA has usually been considered as a modification of pemphigus, occurring in persons of debilitated constitutions, but it is now regarded by the leading modern dermatologists as essentially syphilitic in its nature. It is characterized by the eruption of small flattened bullæ, containing at first serous fluid, which soon becomes purulent or sanguinolent, and concretes or dries into dark black rough crusts heaped up like cockle shells. When the crusts fall off, they leave circular ulcers, of various sizes, indisposed to heal. Most forms are obstinate, often lasting for weeks or months.

A condition like rupia occasionally attacks strumous children, or the offspring of unhealthy parents, but the crusts are not circular, but light yellow and evidently purulent. When it occurs previous to the infant being weaned, the nurse's state of health should be carefully inquired into, so that, if necessary, a new and strong nurse may be obtained. In older children a nutritious diet should be ordered; with tonics, cod-liver oil, and mild alteratives. Change of air—particularly to the sea-coast—will also do good in all instances.

4. BUTTON SCURVY.—*Ecphyma globulus*, or *button scurvy*—as it is popularly misnamed—is a singular cutaneous disease prevalent in the middle and southern counties of Ireland. "This disease," says Dr. Burgess, "is characterized by an eruption of one or more scattered excrescences on different parts of the body, each of which in form resembles a convex button—hence its name—and varies in size from four or five-tenths of an inch to an inch and a quarter in diameter. It is highly contagious (through the medium of the fluid secreted by the excrescence), and is described by some writers, erroneously, as confined to the cuticle. It is not a syphilitic disease;

although sometimes bearing a resemblance to the syphilitic condylomata described by Frickie" (vide Burgess's translation of Cazenave's *Manual on Skin Diseases*. 2nd ed. p. 160. London, 1854). It is ordinarily unattended by constitutional symptoms; being merely a local affection, as is clearly proved by the ease with which the application of the nitrate of silver generally cures it.

VI. PUSTULÆ.

1. ECTHYMA.—This disease may be defined as an acute inflammation of the skin; characterized by large round prominent pustules occurring upon any part of the body, though very rarely on the face or scalp. The pustules are usually distinct, seated upon a hard inflamed base, and terminate in red stains or in thick dark-coloured scabs, which leave superficial ulcers, followed by cicatrices. The important point to remember is that ecthyma is in the majority of cases secondary to some local irritation of the skin, for the relief of which scratching is practised; hence its frequent occurrence in scabies, prurigo, and in cases of inactivity of the skin in badly-nourished subjects. When a child is brought to the practitioner with an ecthymatous eruption, the first point to ascertain is the present or past existence of scabies. If there be a minute papular rash plus the ecthyma—that is, if the eruption is *multiform*—the disease is probably scabies.

Treatment.—This must consist in the removal of all causes of local irritation, the destruction of acari or pediculi, and the use of proper bathing and cleanliness. In addition we may give at the outset gentle laxatives, with alteratives, and then tonics suited to the particular failure in health existing in the patient under treatment. Cod-liver oil, mineral acid, iron and quinine, may be called for with good diet. Water-dressing, or the lotio plumbi, or the unguentum zinci, may be applied to the pustules.

2. IMPETIGO.—*Impetigo*, or *running tetter*, is a severe non-contagious inflammation of the skin; characterized by an eruption of small hemispheroidal or flattened pustules, most frequently grouped in clusters, and forming, thick, rough, yellowish scabs, or incrustations. From beneath the incrustations a discharge takes place; the crusts become thicker and larger; and they fall off, leaving a raw surface. Impetigo is now regarded as a pustular eczema. The mode of distribution of the pustules has caused a division of the disease into two varieties—*impetigo figurata* and *impetigo sparsa*. The first occurs generally on the face, especially on the cheeks; it is attended with constitutional disturbance; and as the pustules burst and form greenish-yellow crusts, resembling patches of dried honey, the heat and itching become intolerable. In children the impetiginous eruption sometimes covers the face like a mask, and is called *crusta lactea*, and constitutes one aspect of infantile eczema. The second form merely differs from the first,

inasmuch as the pustules are more scattered, being sometimes sprinkled, as it were, over an entire limb, or even over the whole body.

The constitutional symptoms are generally very slight, lassitude and headache being the most prominent; but when the troublesome and offensive disease is prolonged,. a state of debility is induced.

Treatment.—During the inflammatory stage sedative fomentations and water-dressing give relief. Subsequently, the benzoated oxide of zinc ointment rubbed down with spirits of wine or glycerine, freely applied night and morning, does great good ; or a lotion of equal parts of olive oil and lime-water will be found soothing. The constitutional treatment must consist in attention to diet, the exhibition of mild laxatives, with salines or alkalies ; and afterwards the use of tonics, especially the biter infusions and tinctures of gentian, calumba, cinchona, or quassia. When stubborn it may be necessary to resort to Fowler's solution of arsenic, in one, two, or three minim doses thrice daily.

Dr. Tilbury Fox, in his *Manual of Skin Diseases*, has recently described a contagious form of impetigo, and his account of the disease has been confirmed as true by Mr. Erasmus Wilson, Dr. M'Call Anderson, and some other observers. It always commences in the form of "little watery heads," that enlarge with purulation of their contents and are replaced by thin yellow flat scabs. It usually is seen on the face, the limbs, and neck. Two or three members in the same family are often attacked at the same time. The diagnosis is made by the origin from vesicles, and the isolation of the scabbed spots, and the contagious quality of the disease. It is readily cured by the use of a white precipitate ointment (gr. 5 to 1 oz.), applied to the raw surface beneath the scabs, which may be removed by poulticing.

3. EQUINIA.—*Equinia*, *Farcinoma*, *Farcy*, or *Glanders*, is attended by *Symptoms* somewhat similar to those of glanders in the horse—viz., by fever, great debility, pains in the limbs, profuse offensive discharge from the nostrils, and the formation of a number of pustules and tumours in different parts of the body, which have a great tendency to suppurate and become gangrenous. The pustular eruption does not appear until about the twelfth day ; it is accompanied by profuse fœtid sweats, and sometimes by the formation of black bullæ. The disease generally proves fatal, before the twentieth day. It occurs for the most part in grooms, stablemen, &c. There is abundant proof of the transmission of glanders from the horse to man.

No *Treatment* seems hitherto to have been of any service. We can only recommend stimulants, and a trial of the salts of potash, especially the chlorate.

VII. PARASITICI.

1. Tinea Favosa—termed *Porrigo favosa* by Willan and Bateman—most commonly affects the scalp, in the form of small cup-shaped, dry, bright-yellow crusts; each containing a hair in its centre, and somewhat resembling a piece of honeycomb, and found upon microscopical examination to be made mainly of the tubes and spores of a fungus. The scabs gradually increase in size, and are highly contagious. At first the small yellow pustules are distinct, but they soon become confluent, and form continuous scabs; they produce troublesome itching; and on removal of the scabs eroded surfaces are left. The parasitic plant causing or accompanying this offensive and troublesome disease is the *Achorion Schönleinii.*

2. Tinea Tonsurans.—*Tinea tonsurans,* or, vulgarly, *ringworm,* is a chronic contagious disease, caused by a parasitic mucedinous plant—the *Trichophyton tonsurans.* It occurs in circular or oval, and slighly-elevated scurfy patches, the hairs of which, rendered dry, discoloured, and brittle by the invasion of the fungus, are broken off a few lines from the scalp. In fact the hairs in the patch of tinea tonsurans look as if they had been nibbled off close to the scalp. If one of these short broken-off hairs be examined with the microscope it will be seen invaded by the spores of the Trichophyton. The patches spread at their circumference, and the rings sometimes assume considerable dimensions. In almost all instances we shall find symptoms of deranged nutrition; the child is languid, pale, and generally out of health.

The most frequent seat of the disease is the head, but it is often seen on the neck, arms, and other parts of the body. There are no hairs of any moment on the general surface of the body, and therefore the aspect of the disease is different from that presented when the head is attacked; there are circular scaly non-discharging patches, and the scales on examination are seen to be invaded by fungus elements, especially mycelium. Ringworm of the surface is called *tinea circinata.* It is often conjoined to tinea tonsurans. Both forms of disease above noticed are contagious. When this disease breaks out in a school, it is for the time a great nuisance.

3. Tinea Kerion.—In some cases the hair follicles are specially prominent in consequence of the inflammation of their walls, and a viscid secretion is poured out on to the scalp, the hair being loosened and broken off as usual, the whole patch looking as though it would become a diffused subcutaneous abscess. The presence of short broken-off hairs, loaded with fungus elements, as seen by the microscope, is diagnostic. Suppuration never occurs, and the practitioner should never be tempted to "lance" the apparent abscess.

4. Tinea Decalvans—or *Porrigo decalvans*—is readily diag-

nosed by the perfectly smooth bald patches which result from the hair falling off on one or more circular spots; these spots varying in size from a sixpenny piece to five or six inches in circumference. Dr. Tilbury Fox declares that if a patch of this variety of ringworm be carefully examined, there will be seen at the extending edge of the disease short broken-off hairs, smaller but of the same aspect as those in tinea tonsurans; and if these be examined with a high power and a good volume of light, a minute form of fungus will be detected constantly. Most observers fail to see the fungus because they do not use sufficiently high powers. The minute form of fungus here referred to is an active one. The parasitic vegetable is *Microsporon Audouini.*

5. TINEA SYCOSIS—the last species of tinea—is characterized by inflammation of the hair follicles, causing successive eruptions of small acuminated pustules, occurring most frequently upon the chin and other parts occupied by the beard; it rarely occurs on the scalp, and seldom or never affects women or children. It is called mentagra by Willan and Bateman, and sycosis by Cazenave. The parasite is the *Microsporon mentagrophytes.*

Treatment.—This is the same in all the varieties of tinea. Great attention must be paid to cleanliness, daily washing with common yellow soap and water being attended with great advantage. The hairs of the diseased patch, if loosened in their bed, should be pulled out, and an inch or two may thus be depilated each day. This is especially necessary in favus. In tinea tonsurans the hairs are brittle and break off, but depilation should be practised as far as possible. Shaving the head, especially over the diseased patch, may suffice if the disease be recent. Should there be any scabs or incrustations they must be removed by poultices or water-dressing. We then attempt to cure the disease by destroying the spores of the parasitic plant. This may be effected in many ways. Having always been successful with a lotion of sulphurous acid, as first recommended by Sir William Jenner—F. 153 (vide *Medical Times and Gazette,* August 20, 1853)—we have always resorted to this agent. Other practitioners employ acetic acid; or a lotion of sulphuret of potassium—60 grains to a pint of water; or they paint the affected parts with the acetum cantharidis; or they apply a stimulating ointment, such as the diluted unguentum hydrargyri nitratis, or a mixture of equal parts of the unguentum hydrargyri ammoniata and the unguentum picis liquidum, or perchloride of mercury, in the proportion of two to six grains to an ounce of lard.

In all cases the local treatment must be conjoined with constitutional remedies, since the spores of these microscopic plants find their most congenial nidus in weakly children. The child should be also taken away from its books; allowed to be much in the open air; fed well upon plain nourishing food; warmly clothed; and be strengthened by tonics, especially quinine and steel, and be induced to take as much fat of all kinds as possible, especially in the form of cod liver oil.

6. Plica Polonica—or *Trichosis Plica*, or *Polish ringworm*—is a disease of the hair little known in this country. It is characterized by tenderness and inflammation of the scalp; the hairs become swollen and imperfectly formed; and the hair follicles secrete a large quantity of viscid, reddish-coloured fluid, which glues the hairs together, uniting them into a mass. It is caused, or accompanied, by two parasitic plants—the *Trichophyton tonsurans* and *Trichophyton sporuloides*. As regards the *Treatment* of this disease little is known, but it is usually recommended that the diseased hairs should not be cut. We may resort to the use of the sulphurous acid lotion, so beneficial in analogous diseases.

7. Chloasma.—*Chloasma*, *Tinea versicolor*, or *Pityriasis versicolor*, makes its appearance generally on the front of the chest or abdomen, in the form of small spots of a dull-reddish colour, which gradually increase in size, and assume a fawn tint. It may last from a few days to many months or years. It is contagious, and is accompanied by itching when the body gets warm. The fawn-coloured patches are slightly raised, and from them scales may be scraped, in which with the microscope may be detected spores arranged generally in little heaps, and mycelial threads branching in all directions. It is necessary, in order to see the fungus, to take a very thin portion of cuticle and to render it transparent by liquor potassæ. This disease is caused by a cryptogamic plant—*Microsporon furfur*. It may be cured by the use of the sulphurous acid lotion, or by a lotion of perchloride of mercury in water (gr. 2 to oz. 1), applied night and morning, or the use of a lotion containing half an ounce of hyposulphite of soda in six ounces of water, which is to be freely applied two or three times a day after the normal fatty matter has been removed by soap and water. In order to prevent a return of the disease in severe cases, the application of remedies should be continued for a fortnight or three weeks after all evidence of actual mischief has disappeared.

8. Scabies.—*Scabies* or *psora*, or *the itch*, is a contagious disease—contagious in that sense which implies contact—dependent upon the presence and burrowing of an insect, the *Acarus scabiei*. It may occur on any part of the body, but it is most frequently found in the interdigits, and on the front of the forearm. An opinion prevails that scabies never attacks the face; but this seems to be incorrect, though it is very rare in that locality. The pathognomonic feature of scabies is the acarus in its burrow, or cuniculus as it is termed. When the acarus gets beneath the skin, the direct result is the formation of a vesicle, as a result of the irritation set up; the acarus then makes for itself a channel, which may be seen if it has not been scratched open by the patient, as a minute raised line running away from the vesicle just spoken of in a straight or tortuous direction for several lines, and even half an inch and

more. At the end of this burrow the acarus may often be seen as a minute opaque speck, and may be extracted by the aid of a needle. Now the vesicle and attached cuniculus is the only really certain diagnostic mark of scabies. The other phenomena are accidental. But in addition to the presence of vesicles and cuniculi between the fingers and about the wrists, a papular rash is observed on the front of the forearms, about the abdomen and the front of the thighs, and often about the nipples in women, and along the upper line of the penis. And if the patient be out of condition and scratch much, ecthymatous pustules show themselves. In young children, the eruption of scabies may be absent from the hands, and appear first of all about the buttocks, and it is then the disease takes the form of an ecthymatous rash interspersed with papulæ, the feet being often affected. Scabies generally causes severe irritation as soon as the body becomes warm in bed. Several members of a family are often affected by the disease at the same time.

Treatment.—Scabies never disappears spontaneously. It is readily cured by killing the insect, and perhaps no agent does this so readily as sulphur. Hence, after a good washing, the affected parts are to be well covered with sulphur ointment, in the proportion of half a drachm of sulphur to an ounce of lard with a little carbonate of potash and essential oil. This should be used night and morning for three days, especially to the interdigits and wrists. Then the patient should take a warm bath, and use yellow soap freely. If there be no itching the disease is probably well, though it may be useful to apply the sulphur ointment gently for a day or two longer. If sulphur be applied too freely to the skin, a troublesome erythematous or eczematous eruption may be set up. This should always be avoided. As the patient's clothes will probably be contaminated, they must either be destroyed, or at all events thoroughly fumigated with sulphurous acid gas, which may be procured by igniting a rag dipped in melted sulphur.

When scabies is complicated with other eruptions, it must be cured before the relief of the latter is attempted.

VIII. SQUAMÆ.

1. LEPRA.—*Psoriasis*, or *Lepra vulgaris*, is perhaps the most obstinate and troublesome of all cutaneous diseases. It is a non-contagious chronic eruption: characterized by the development of patches, of various extent and form, slightly raised above the level of the skin, covered by thin, whitish scales of altered epidermis, and accompanied by rhagades or fissures of the skin. The eruption may be local, or it may be diffused over the whole body. The white scaliness is a primary formation, and not the result of any discharging condition. The scales are not made up of inflammatory products, but are entirely composed of epithelial scales. Several varieties have been named, such as *Psoriasis punctata, guttata,*

circinata, gyrata, diffusa, inveterata. There are also local varieties.

Treatment.—With regard to local applications, the preparations of tar are very useful. The scales should be removed by poulticing or wet packing, and then some "tarry" compound applied by means of a brush. The most convenient form is perhaps the pyroligneous oil of juniper in the proportion of one part to four of lard; it should be well rubbed in night and morning. In very chronic cases the addition of sulphur is of much service. As regards general remedies, liquor potassæ, in large doses, thrice daily, is often beneficial; or the liquor potassæ arsenitis; or the triple compound of iodine, arsenic, and mercury, known as Donovan's solution, may be cautiously given with the greatest advantage. Where these remedies fail, the decoction of dulcamara, or decoction of sarsaparilla and perchloride of mercury, tar capsules, tincture of cantharides, or the iodide of potassium may be tried. We have obtained marked success by applying chrysophanic acid, in the form of ointment, as recommended by Dr. Balmanno Squire. The ointment may contain from ten to a hundred grains of the acid to the ounce, according to the chronicity of the disease. It causes a peculiar prune-juice discoloration of the skin, but this passes off. It also stains the linen, and is accordingly deemed by some objectionable. Further, it produces œdema about the eyelids if allowed to come in contact with them. Having in mind the inveteracy almost of the affection, and its chronic character, the drawbacks named appear to us very minor, as the majority of them are removable or avoidable. The Harrogate waters have been recommended. At the same time the diet must be very simple, and all stimulating food or drink avoided. During an arsenical course, all acids, fruits, and vegetables should be avoided. In young persons cod-liver oil certainly helps the cure of the disease.

A distinction was formerly made between psoriasis and lepra: the term psoriasis was applied to those patches which were irregular, and not clear or depressed in the centre; lepra, to those that were circular and depressed in the centre, with elevated margins, and a centre free from disease. Both varieties are sometimes hereditary, and both require the same treatment.

2. PITYRIASIS.—This disease is a chronic inflammation of the skin, attended with redness and itching, and characterized by the production of minute white scales or scurf in great quantity. It may attack any region, but the scalp and parts covered with hair are the most common seats of it. The desquamation takes place copiously and incessantly.

Treatment.—Some tonic infusion, an occasional purgative, and the use of alkaline lotions to the affected part are indicated. Occasionally a modified form of the unguentum hydrargyri nitratis does much good applied daily. When the head is the part affected, the hair should be cut off close to the scalp, with a pair of scissors. Great cleanliness is essential. The disease is often very rebellious to treatment.

8. Ichthyosis.—*The fish-skin disease,* is characterized by the development, upon one or more parts of the integuments, of thick, hard, dry, imbricated scales of a dirty grey colour resting upon an uninflamed surface, and unattended by heat, pain, or itching. In its best expressed form it is called *Xeroderma,* the skin being dry, thin, and desquamating generally. In its excessive development it constitutes the *porcupine* disease of authors, the scaly collections forming masses of a dark colour raised considerably from the surface. These masses are made up of epithelial and fatty matter. It is said to be a congenital disease, and to last during life.

Simple warm and alkaline baths, with the application of glycerine, may be used as palliatives; no other treatment seems of any use. Cod-liver oil might be tried.

IX. HÆMORRHAGICA.

1. Purpura.—This disease arises from a morbid condition of the blood and of the capillaries. The blood is deficient in fibrinous elements, while the capillary vessels are softened; and there is a want of tone in all the tissues. Hence extravasations of blood into the tissues readily occur; either from pressure, or from the force of the circulation.

Symptoms.—The spots or patches vary in colour, being either red, purple, livid, or reddish-brown; they often bear a great resemblance to bruises; pressure does not efface them; they sometimes persist for months; and they are aggravated by impure air, insufficient food, deficient exercise, &c. The constitutional symptoms indicate debility; varying from slight depression to hectic feverishness, constant faintness, œdema of the lower extremities, and the most complete prostration ending in death.

Species.—Four varieties are commonly enumerated:—*Purpura simplex,* in which the spots are small, the symptoms of mal-assimilation prominent, and the languor and lassitude distressing, but not dangerous: *P. hæmorrhagica,* the local and constitutional symptoms being those of purpura simplex, in a very aggravated form, with the dangerous complication occasionally of internal hæmorrhage: *P. urticans,* which commences with the formation of slight elevations or rounded wheals like the eruption of nettle-rash, although the irritation of the latter affection is absent; and *P. senilis,* which occurs frequently in elderly persons from some local irritation.

Diagnosis.—This disease must not be confounded with scurvy, which it somewhat resembles. It differs, however, inasmuch as it often appears suddenly; is not owing to any want of vegetable food; and is not attended with a livid, spongy state of the gums.

Treatment.—As purpura is a disease of debility, the treatment must consist in the use of good diet; the removal of any irritant secretions contained in the alimentary canal; tonics, especially quinine and iron, and the mineral acids; and a sojourn at the sea-side during convalescence. The oil of turpentine, in small, frequently repeated doses, has been strongly recommended. Ergot has been found very efficacious administered by the mouth, or injected hypodermically in the form of ergotin. Transfusion of defibrinated blood has been successfully performed in the *hæmorrhagic* variety.

2. SCURVY.—*Scorbutus* is a peculiar disease caused by long-continued deprivation of fresh succulent vegetables. It does not often occur during childhood.

Some authors speak of land scurvy and sea scurvy as if they were two different complaints. We believe them to be identical. The same authorities have also regarded land scurvy and purpura as one and the same affection; there is little doubt but that they are very dissimilar.

The *Symptoms* of scurvy show themselves gradually, and commence with lassitude, mental anxiety, and difficulty of breathing on the least exertion. The countenance becomes sallow and of a dusky hue; the gums swell, are spongy, of a livid colour, and bleed on the slightest touch; the teeth loosen, and the breath becomes very offensive. As the disease advances the debility increases; the dyspnœa often becomes most urgent; the gums frequently slough, and hæmorrhages occur from them, as well as from the mouth, nose, stomach, and intestines. Ecchymoses or effusions of blood beneath the skin also appear, especially on the lower extremities and trunk; and many parts of the body become discoloured with bruise-like marks, so that the patient appears as if he had been severely beaten. The legs swell; the skin is dry and rough; the urine is scanty; in some instances there has been spontaneous salivation; and there is generally constipation. Unless relieved, the patient dies from exhaustion.

Dr. Garrod believes that in scurvy the blood is deficient in potash, and that this deficiency is indeed the cause of the disease. He shows that all substances which act as anti-scorbutics contain this agent, and he has rapidly cured cases by the use of some of its salts. These views have been confirmed by Dr. Hammond, who has cured and prevented the disease by the bicarbonate of potash, when fresh vegetables could not be obtained.

Treatment.—That usually adopted, consists in the administration of those vegetables which are remarkable for their anti-scorbutic qualities, such as oranges, lemons, potatoes, lime-juice, &c. If we believe in the soundness of Dr Garrod's opinions, we shall employ the chlorate, or the phosphate of potash, or the tartrate, or other potash salt of the vegetable acids.

X. TUBERCULA.

1. ELEPHANTIASIS.—There are two species of this disease described in books—viz., *Elephantiasis Græcorum*, and *E. Arabicum*, but they bear no resemblance the one to the other. The term

Elephantiasis should be confined in its use to the former of these two affections, or the true Leprosy; the term *Bucnemia* being given to the second.

True elephantiasis, the leprosy, or *Elephantiasis Græcorum*, is a terrible and dangerous affection; rarely contagious, but hereditary, and generally incurable. It follows repeated attacks of malarial fever, in those who have resided in certain localities; and it is characterized by the appearance of patches of a light-brown colour, scattered over the body, its trunk and limbs. Dr. Tilbury Fox tells us that he has seen this condition on several occasions mistaken for syphilitic staining. These stains are succeeded by elevated tumours having the same tint, irregular in shape and size, soft and smooth, and which generally—after a certain time—become the seat of unhealthy ulceration. After a while anæsthetic patches are developed in the centre of the original ones, and they may assume a whitish hue. About the same time that brown patches are being fully developed on the body, sensations of pins and needles, numbness, or heat may be experienced in the legs or arms, and presently complete anæsthesia of the parts so affected is observed. This may be discovered accidentally. The anæsthesia is due to disease of the nerve trunks superficially situated. The face becomes affected by the disease; it looks at first as if flushed, the flush being persistent; it browns, and tubercles are developed all over it, so that the whole features are distorted by the general thickening. The patient dies after some years, exhausted by ulceration, or marasmus. This disease is not met with in temperate climates, but there is found to be a disposition to it as we approach the polar regions on the one hand, and the tropics on the other. Males suffer from it more than females.

Bucnemia tropica, or so called *Elephantiasis Arabicum*, is characterized by repeated attacks of lymphatic inflammation, which are followed by great swelling and induration of the skin and of the subjacent areolar and adipose tissues, producing marked deformity. It generally attacks one of the lower extremities, causing great swelling, so that the limb becomes double its natural size, hardness, severe pain, and an appearance resembling—it is fancifully said the leg of an elephant. It is uncommon in Europe, occurring principally in the West Indies; it generally continues for life; causes marked constitutional disturbance; is neither contagious nor hereditary; and attacks indiscriminately males and females, the rich and the poor.

2. MOLLUSCUM.—This term has been applied to two very dissimilar diseases; the one a sebaceous disease, the other a fibrous outgrowth from the skin now termed *fibroma*. In the former case, to which the term molluscum should be solely applied, the little fat glands of the skin are dilated and rendered prominent by semi fluid sebum. True molluscum consists in the presence of small sessile button-like tumours of skin colour, varying generally in size from a

pea to a shirt-button, sometimes of a darker colour, sometimes exhibiting a narrow peduncle. If the little prominences be examined they will be seen to have a minute hole in the centre, this is the opening of the sebaceous duct; and if the tumour be squeezed, there oozes therefrom a creamy matter, sometimes diffluent, at other times firmer; this is altered sebum. Occasionally this disease has appeared to be contagious, hence the term *Molluscum contagiosum*, and in such cases the contents of the little tumours are perhaps specially fluid. The cure is effected by turning out the contents of each molluscous growth, and applying caustic to the sac.

The *fibroma* mentioned above is an outgrowth, sessile or pedunculated, of white fibrous tissue. When minute it resembles true molluscum, but wants the central opening and sebaceous contents. The growth in fibroma may be enormous in size.

3. ACNE.—*Acne* is a disorder of the sebaceous glands of the face. When the sebum is simply retained and blocks up the gland ducts, we have the well known "black pimples" seen on the face of young and lymphatic subjects, or *Acne punctata*. If there be slight irritation and redness in addition, *Acne simplex* is said to be present. When there is much induration about the gland wall, and the acne spots become pustular, we have *Acne indurata;* and when there is inflammation of the tissue about the glands, rather than a distension and swelling of the glands themselves, we get *Acne rosacea*. The latter variety occurs in women of middle age, oftentimes with uterine disturbance. The other forms of acne develop at puberty, when there is a general physiological excitement of the glands of the body, and consequently when external irritants and digestive disorders, by reflex action, are more potent to affect the circulation of the face. The treatment consists in improving the general health, allaying local irritation by soothing applications, and in employing topical stimulating agents.

4. LUPUS.—Lupus is generally a most formidable affection. There are three forms of this disease, *Erythematous lupus*, *Lupus non exedens*, and *Lupus exedens* or *noli me tangere*. In the *first* there is diffused deposit in the skin of degenerate material, but not so great as to cause elevation to any sensible extent, the patch looks like an erythema, but it is clear that atrophy results from loss of substance, which follows the removal of the new deposit and the non-formation of healthy skin. In the *second* there is no ulceration, yet tubercles form and leave deep cicatricial pits behind them; when it spreads rapidly and superficially, it leaves the skin crossed by white scar-like ridges and bands. The *third* is very destructive; it attacks the nose more frequently than any other region of the body, though why it does so is unknown. The extent of parts which it destroys varies; sometimes the whole nose being eaten away, sometimes only the point. In some cases lupus is accompanied by evidence of the scrofulous diathesis, and in others only by signs of the existence of a lymphatic temperament in the attacked.

Treatment.—Any strumous tendency must be met with cod-liver oil, the iodide of iron, and quinine. A prolonged course of the liquor hydriodatis arsenici et hydrargyri, or of the liquor potassæ arsenitis, or of iodide of potassium and decoction of sarsaparilla, is necessary in the two severer varieties.

The abnormal tissue action should be checked by the use of some caustic. The acid nitrate of mercury is now much used to destroy the tubercles formed, and it should be applied to the extending edge of the disease. In the erythematous variety of lupus, the continuous application of mercurial plaster spread on thin linen has cured rapidly in some cases lately recorded. In lupus exedens, chloride of zinc, or potassa fusa, or nitric acid, must be used to destroy the ulcerated surface and excite the capillaries to a more healthy action.

5. FRAMBŒSIA.—*Frambœsia*, or *pian*, or *yaws*—in Guinea, is rarely met with in Europe, but is common in Africa, America, and the West Indies. Without any precursory symptoms, parts of the skin—especially about the face, scalp, axillæ, or genital organs—become covered with small dusky-red spots; these gradually become converted into larger tubercles, isolated at their summits, but collected together at their bases, often resembling raspberries or mulberries in their colour and form. The tubercles are generally hard, covered with dry scales, and are sometimes inflamed; if the inflammation spreads, ulceration sets in, and a yellow sanious discharge results which forms scabs around the tumours. The disease continues for years, or even for life.

6. KELOID.—*Cheloidea*, or *Cancroide*, was first described by Alibert under the above names, owing to the disease presenting a flattish raised patch of integument resembling the shell of a tortoise. It consists of small, flat, painful tumours, one or two inches in diameter, raised a few lines above the level of the skin, having irregular forms with slight depressions in their centres, and being covered with wrinkled epidermis. Sometimes there is only one tumour, sometimes several; the disease is very rarely seen; it is developed slowly, seldom ends in ulceration, may disappear spontaneously merely leaving a cicatrix, and is usually found on the chest between the mammæ.

XI. MACULÆ.

1. CHANGES OF COLOUR.—The skin sometimes becomes of a bronze or slate colour; as may occur—either—after the long continued use of nitrate of silver, or naturally without any appreciable cause. The change is generally permanent. *Nigrities* is a term employed when the formation of pigment is so excessive that the skin is rendered of a slate colour, or even black. One of the prominent symptoms of disease of the supra-renal capsules is, according to the late Dr. Addison, bronzing of the skin; though why there should be such a remarkable excess of pigment in this affection we

cannot tell. The deepening of colour which takes place in the areola of the breast of a pregnant woman is a familiar example of this physiological change, and not the less remarkable because of its constant occurrence.

Lentigo, or *Freckles*, or *Sunburn* is generally congenital; the spots mostly cover the parts of the body exposed to light. Freckles are more common in fair than in dark complexions; they are sometimes excited by the sun, and are most common in warm countries.

Ephelides are yellow irregular spots, which sometimes appear temporarily on the chest, abdomen, and groins, from errors in diet, &c.

2. Loss of Colour.—The absence of the colouring matter of the skin may be congenital or accidental.

In *Albinismus* the skin is of a dull white milky colour; the body is covered with a woolly white down; and the eyebrows, eyelashes, and hairs generally are smooth, silky, and white. The iris is of a rose colour, and the pupils present a deep red appearance, owing to the absence of pigment in the choroid and uvea. The Albino is generally weak minded, and of a delicate constitution: he is found amongst all the races of mankind.

Leucoderma.—In this affection the skin is the seat of a partial discoloration, congenital or accidental. The discoloration may appear on any part of the body in the form of smooth, milky-white coloured patches. It may occur at all ages, and it generally lasts for years.

Note.—In this chapter we have, for the sake of completeness, described some cutaneous affections which are seldom or ever met with in children, and which might, therefore, be considered out of place in a work like this. The reader will perhaps excuse the addition, if the matter prove, as we hope it will, useful.

CHAPTER VII.

DISEASES OF THE EYES.

THE diseases of the eyes which are frequently seen in infancy and childhood, although for the most part curable if early treated in a proper manner, may yet, if neglected, soon produce permanent injury or even absolute blindness. They are therefore eminently worthy of the best attention of the practitioner. In the space allotted to the subject in this volume, it is manifest that only a few leading points can be even cursorily discussed.

Excepting the mild form of purulent ophthalmia that may occur soon after birth, it can hardly be said that any disease of the eye is peculiar to early life. Certain affections, however, are more common during childhood than at any subsequent period; and, on the other hand, there are many eye diseases of the adult from which children are almost or altogether exempt.

Excluding for the moment cases in which vision is impaired or destroyed by deep seated changes, it will be found that, as a rule, children who are brought for advice about their eyes present some obvious symptom that it would be impossible to overlook. Either their eyelids are swollen or sore, or spasmodically closed against the light, or the surface of the conjunctiva is congested, or the cornea is turbid. Such conditions, striking the observer at his first glance, sometimes conceal others which, although less conspicuous, may be far more noteworthy It is an important rule of practice, a rule to which there is no exception, always to make a careful and complete examination of the diseased eyes of a child, and to be quite sure that no morbid change has escaped observation. Such an examination should generally be made at the first visit; but, more especially if the case resists treatment, it should never be long delayed.

MODE OF EXAMINATION.—When intolerance of light is absent, or is only trifling in degree, it will often be possible to see all that is required by the exercise of a little patience, and of that freemasonry which some men so soon establish with children. The display of an attractive object, held in different directions in succession, will serve to turn the gaze upwards or downwards, to the right or to the left; and if this object be at last given as a plaything, the eyelids may be gently handled and lifted. But if there be much photophobia, or if the eyes are painful, or if the child is frightened, and cries or struggles, or if it is old enough to resist and not old enough to be reasoned with, it will be useless to waste time in trying to coax it into submission. The parent or nurse should then sit opposite the doctor, with the child on her knee, and should lower it down backwards until its head is received between his knees, and firmly grasped there. She should then restrain the arms and legs, when the necessary inspection may be proceeded with. In cases of purulent ophthalmia in infancy, or in cases where there is much swelling of the upper lid in an older child, and where one glimpse of bright cornea will give the assurance that this structure is not implicated in the mischief, it will usually be possible to raise the lid sufficiently with the finger; the skin being first dried with a bit of soft rag. If there be much discharge, or crying, or resistance, a smooth metallic retractor may be slipped under the lid, and should be so used as to lift it a little off the globe, on which no pressure should be exerted. But if a more protracted and minute examination be required, or if there be photophobia, with rotation of the eye upwards, it is best to give at once a few whiffs of chloroform. Very little will usually be enough. When a sufficient effect is produced, the lids may be kept apart by a wire spring; the eyeball rolled down, if required, by the application of toothed forceps to a little fold of conjunctiva and subconjunctival tissue immediately below the cornea; and the surface either illuminated or magnified by the aid of a convex lens. At the same time any local application may be effectually made, and the eye protected by a proper dressing before consciousness is restored. Whether chloroform be given or not, the lids must never be forcibly separated when their edges are gummed together by secretion. In this case a soft sponge and warm water should first be used, and all the adhesions softened or dissolved.

DISEASES OF THE EYELIDS.—Dealing with morbid phenomena in the order in which they would present themselves to observation, we take first the eyelids. They may depart from the healthy condition in various ways. The upper lids, or one of them, may be closed passively, by swelling or paralysis; or both lids may be closed actively, by spasm. The edges may be sore, or dotted with pustules, or everted; the cilia absent, irregular, or loaded with crusts of dry secretion.

Passive closure of the lids by swelling is usually, but not always, attended by external redness. The first care of the surgeon is to raise the lid, and to note the condition of the cornea and conjunctiva. If they are free from disease, the swelling is probably due to inflammation or œdema originating in the lid itself; but if the cornea be hazy or ulcerated, or if there be purulent or muco-purulent discharge from the conjunctiva, then the disorder of the lid must be regarded not only as secondary, but as being comparatively unimportant. The case will be one of keratitis, or of purulent ophthalmia.

Hordeolum or Stye.—Inflammatory swelling of the eyelid is not uncommon in children from two years old and upwards. In its slighter forms the increase in thickness and the superficial redness are both most evident near the tarsal margin, and the edge of the lid seems to stand off from the eyeball below. Such swelling is occasionally produced by the little boil known as a stye, and is then characterized by a distinct central elevation, with formation of pus. Sometimes, however, there is no tendency to suppuration, and the swelling is evenly diffused over the affected part. In the latter case a speedy cure may usually be obtained by the application of a leech just outside the external canthus, at the margin of the orbit In the former, little or nothing can be done for a stye that has fairly commenced. Perhaps warm fomentations or poultices may prove comfortable, and a puncture with a lancet or needle will hasten the discharge of the slough. The treatment of stye must be mainly directed to preventing its recurrence; for the little boils often implicate the follicles of the cilia, and cause defective or distorted growth of these important appendages. The general treatment must be guided by such indications as the condition of the health may afford. The state of the refraction should be examined, and any excessive exertion of accommodation, due to hypermetropia, must be corrected by spectacles. The presence of loose eyelashes, in this as in other forms of tarsal disease, is apt to be a source of irritation; and all such should be duly removed by gentle traction. In some cases an incipient stye may be made to abort by pulling out a hair passing through its apex, and by carefully touching the spot with a moistened pencil of nitrate of silver.

Swelling of the eyelid of a more extensive character, reaching to the orbital portion, or even up to or beyond the superciliary ridge, is usually a symptom of suppuration in the cellular tissue of the orbit. When this is so, it is always attended by some congestion of the conjunctiva, and by distinctly serous effusion beneath that membrane, which is elevated by fluid almost after the manner of a blister. The congestion is not of a character to produce uniform redness; it depends chiefly on the distension of moderately large vessels, which pass over the elevated portion. The elevation does not at first reach to the margin of the cornea, and is for a time partial, serving as an index to the direction in which pus will be found. If the sight should be uninjured, the surgeon may poultice, and wait for the abscess to discharge itself; but the slightest dimness of vision should lead to an immediate evacuation of the pus. A tendon knife or other appropriate instrument should be thrust into the orbit by the side of the eyeball, in the suspected direction, and either below or above the eyelid according to the amount of swelling. If pus be not found at once, it is better to explore for it among the orbital tissues with a blunt probe, or some similar instrument.

Ptosis, or closure of the eyelids by paralysis, drooping of the lid, is an occasional result of some affection of the nervous centres, connected with dentition, or of some subsequent affection of a graver kind, or it may depend upon pressure on a nerve within the orbit. It always demands careful study of its cause; and in this study obvious anatomical considerations will come into play. The paralyzed muscle (levator palpebræ) is supplied by one of the two branches of the superior division of the third nerve, the other branch going to the superior rectus. If, therefore, when the paralyzed lid is raised by the finger, it is seen that the patient has power to rotate the eyeball directly upwards, so that the superior rectus does not participate in the disorder, it becomes manifest that the mischief must be limited to the branch supplying the levator. Participation of the superior rectus, without paralysis of any other of the ocular muscles, would limit the mischief to the superior division. Disease behind the bifurcation of the third nerve would affect the levator palpebræ, the superior, internal, and inferior recti, the inferior oblique, and the sphincter pupillæ, leaving only the superior oblique, the external rectus, and the dilatator pupillæ in action. The lid would be drooping, the eyeball turned outwards, and the pupil dilated. The causes of such disease as this must usually be sought in the nervous centres—although sometimes in local changes within the orbit: the treatment must be governed by the best light that can be thrown upon the nature of the primary lesion.

When the paralysis has become chronic, and manifestly incurable, the deformity may often be removed, in great measure or entirely, by operation. The upper eyelid must be shortened by the excision of a strip of skin and muscle; and the position of the eyeball regulated by complete division of the external, coupled with bringing forward of the internal rectus. Such operations require to be very carefully planned, with reference to the degree of deformity, and by the light of experience of the eventual effect of a certain degree of displacement. They can only be prudently undertaken by a skilled ophthalmic surgeon: the details of their performance will be found in books devoted to ophthalmology.

Photophobia.—Closure of the eyelids by spasm is seen in children only in connection with the condition known as photophobia, or intolerance of light. Photophobia is usually associated with vesicles or ulcers on the cornea, and varies greatly in degree. There are many children with some corneal affection to whom light is painful, or at least irksome. They seem to have no power to open their eyes, and when told to do so usually open the mouth instead. From this slight degree we meet with all gradations, up to a condition in which the orbicular muscles are contracted with all possible force, the features distorted to aid in the contraction; or the child will hide its face in the darkest corner of the room, in its hands, in pillows, in its mother's dress, excluding every gleam of light by every available protection. In such cases the eyelids are so closely shut, that tears find no continuous outlet, but accumulate under the lids, and escape in hot gushes when these are raised.

Physiologically considered, photophobia is a condition of the highest possible importance. It is usually associated with superficial inflammatory conditions, and it may coexist with absolute blindness. The evidence is conclusive that it depends entirely on the fifth pair of nerves, and in no degree on the optic nerve or retina. It is, therefore, an example of a nerve being rendered susceptible, by morbid irritability, to impressions of which it naturally takes no cognizance; and it illustrates the modern physiological doctrine, so well stated by Helmholtz, that the sensitiveness of the optic nerve to light is not the result of any special endowments of the percipient or conducting elements, but only of contrivances by which the former are habitually acted upon by that mode of force, and secluded from the operation of others. The inference is, that if the fifth could replace the optic nerve in the eye, light would produce pain, just as habitually as it now produces vision.

Pathologically considered, photophobia is an effect of disease; and, in its turn, becomes an agent by which that disease is maintained and aggravated. In its extreme forms, photophobia, is chiefly seen in cases of corneal affection that have been either neglected or aggravated by the improper use of caustic or irritant applications. When present, it becomes a quc tion of degree whether we shall cure the corneal affection, and so get rid of the spasm of the eyelids, or whether we must get rid of the spasm before the corneal affection can be cured. It is manifest that a high degree of spasm must be itself injurious. The pressure exercised upon sore eyeballs produces reflex muscular action by which that pressure is maintained; and the retention of irritating tears is not only injurious in itself, but serves to dilute and remove any local applications that may be used. The muscular contraction maintains a high degree of venous congestion. In most cases, and especially if the patient can be seen daily, we may first try the effect of treatment upon the original malady. But if this fails to afford relief, or if the patient comes from a distance, or if the photophobia has been long continued, and is severe, it is well to treat the spasm in the first instance. A fair practical test of severity is afforded by the fact that two opposing surfaces of skin, when in prolonged and close contact, assume somewhat of the character of mucous membrane. In a case of aggravated spasm, when the orbicularis is rendered passive by chloroform, we find a little moist red chink, running horizontally outwards from the external canthus towards the margin of the orbit. The surfaces of skin have here been brought into contact by muscular action, and the change referred to has taken place in them. When this chink is well marked, it will usually be necessary to cure the spasm before we can cure the eye.

The cure of the spasm is fortunately simple and easy. It is only necessary to render its continuance impossible for a time, by complete division of the peccant muscle. This is best done in the direction of the chink, by transfixing with a small bistoury from within outwards, and dividing conjunctiva, muscle, and skin, in a horizontal line, right up to the margin of the orbit. The loaded veins will empty themselves by free bleeding, which soon stops, and which is probably highly salutary. The closed lids may then be covered with compresses dipped in cold water, and retained by a bandage, and the patient should be put to bed in a darkened room, from which all but dim candle-light is excluded. In twenty-four hours the corneæ will have lost their irritability, and may be submitted to treatment. In forty-eight hours the patient will usually be able to walk abroad in daylight without inconvenience. The incisions will heal without leaving any visible cicatrices.

The method thus described will appear startling to some readers, but there is no reason why it should do so. The principle on which it rests is well established. There are many conditions in which spasm of a sphincter muscle maintains or aggravates disease, and in which the division or dilatation of the sphincter is a necessary preliminary to treatment. Dilatation is inapplicable to the orbicularis, and only division remains to be done.

It is probably quite true that many of the cases of spasm of the eyelid that are cured immediately by myotomy, might be cured without it in course of time. But, in the treatment of eye disease, rapidity of cure is a matter of primary importance, because the tissues of the eye are liable to be irreparably injured by the continuance of morbid processes, and because the use of the organ is essential to the discharge of most of the duties of life. The malady in question, moreover, involves great suffering, and the slight operation recommended (which may be done under chloroform during the examination) is so speedy, certain, and harmless a remedy that, in any bad case, there should be very cogent reasons to justify neglect to employ it.

Ophthalmia tarsi, tinea tarsi, lippitudo, blear eye, &c., &c.—The eyelids, although naturally open, may present various degrees of soreness, being ulcerated along their edges, or having their edges everted, the eyelashes irregular or distorted, or covered with crusts and scabs. All these conditions, degrees, and forms may be conveniently considered as presenting two stages: the first, in which eversion of the tarsal conjunctiva has not yet taken place; and the second, in which this eversion is more or less confirmed. In the former, the treatment consists in the careful application of astringents to the seat of the disease. For this purpose all crusts or scabs must be first softened with warm water, and then very gently but very completely removed. When the surface is clean, and has been dried with a bit of soft rag, the astringent selected may be applied. The best, or the best to begin with, is, in most cases, the ointment of yellow oxide of mercury, first introduced into ophthalmic practice by Dr. Pagenstecher. The oxide is prepared by precipitation with caustic potash from a solution of the perchloride, and, after being well washed and dried, may be added to simple ointment, in the proportion of from half a drachm to one drachm to the ounce.

A little of this ointment should be taken up on the tip of a fine camel's-hair pencil, and worked into the little sore places at the roots of the cilia; the application may be repeated daily. At the same time, the row of cilia should be gently pulled, to remove any that may be dead and sources of irritation. If the improvement be not satisfactory or steadily progressive, another remedy may be tried. The citrine ointment prepared with cod-liver oil, as recommended by Dr. Williams, is often of great service. If both ointments fail, the direct use of nitrate of silver may be tried: it may be applied in solution, by means of a brush; or in substance, either pure, or diluted with nitrate of potash to any required degree. It should not be repeated more frequently than twice a week, and, if applied in substance, the sticks should be small and finely-pointed. No treatment will be of much avail unless it is carefully carried out for a considerable time, and is aided by scrupulous cleanliness. In some cases, where the discharge is profuse, and dries rapidly into crusts on the eyelashes, it is desirable to keep them closely clipped; and in all cases the margins of the lids should be smeared with simple ointment at night, and, if adherent, bathed with warm water before they are separated in the morning. When eversion has taken place, a new complication presents itself. One or both of the puncta lacrymalia (more frequently the lower one only) will be removed from contact with the eyeball, and will no longer take up the tears, which, floating in the lid, and flowing over upon the cheek, serve greatly to increase the irritation. In such cases the canaliculus should be slit up from the punctum to the caruncle, and the edges of the slit separated from time to time for a day or two, and until they no longer tend to reunite. This little operation may be performed with a fine knife and director, or with fine scissors; and the edges may be separated by a probe or knitting-needle. When the channel of exit for tears has been in this way restored, the other treatment already described will require to be followed with great care and perseverance.

Fistula Lacrymalis.—In these cases, and also in others where there is no affection of the eyelids, it sometimes happens that there is an overflow of tears from obstruction of the nasal duct: this condition may lead to abscess of the lacrymal sac, bursting on the cheek and a permanent opening may result. It is desirable to anticipate such an event by removal of the obstruction; and this may be effected by dilatation, with Bowman's probes, passed from the divided canaliculus through the sac into the nose, together with the use of suitable astringent applications. But the use of the probes is not to be recommended to those who are unpractised with them. Even in the adult, and still more in children, they are very liable to make false passages, and to do permanent mischief to the delicate structures concerned.

Taking the parts of the eye in the order in which they present themselves, we come next to the CONJUNCTIVA. This membrane, which is reflected from the eyelids upon the globe, and continued, as far as its epithelium is concerned, over the cornea, is liable, in early infancy, to acute inflammation with purulent discharge, the so-called *Opthalmia Neonatorum;* and, during childhood, to slight inflammation with mucous discharge, the so-called *Catarrhal Ophthalmia.*

Ophthalmia Neonatorum and Catarrhal Ophthalmia.—The purulent ophthalmia of infants usually commences within the first few days of life. It is probably often caused by direct inoculation with the maternal secretions, and it appears to be sometimes aggravated by injudicious exposure of the new-born eyes to light. In a large proportion of the worst cases, the patients are the subjects of inherited syphilis. The disease commences in the conjunctiva, and if unchecked, may spread to the cornea also. When brought to the surgeon, the lids are usually puffy and swollen, often adherent by dried secretion at their margins. When these are separated, the palpebral conjunctiva is seen to be bright red, villous, and tumid, the ocular conjunctiva covered by vessels, and the whole surface discharging pus, which is sometimes of a thick and fibrinous character, so that it may be removed by forceps. These cases are readily amenable to *Treatment* as long as the cornea is intact, or but slightly affected; and it is therefore highly desirable that this structure be clearly seen. By patience and gentleness, and by cleansing the eye with a stream of warm water from a sponge or syringe, this may generally be accomplished; but it is better to go without the information than to obtain it by rough handling. We have known an ulcerated cornea ruptured, and the crystalline lens squeezed out, by the unskilful efforts of the surgeon to ascertain the exact state of the case. When the lids are very tumid, and readily everted, it is usually best to lift the upper lid by a small retractor, the use of which affords a good view, and obviates all risk. If the cornea be bright and clear, the only treatment necessary will be cleanliness and the use of a mild astringent. Some surgeons use an alum lotion; but we prefer a solution of nitrate of silver, containing two grains to the ounce. The infant's head being fixed in the same way as for examination, the pus should be gently and thoroughly washed away with a small fine sponge and clean, warm, soft water; a stream being allowed to trickle from the sponge upon the lids, and these being gently separated with the fingers. Another sponge may be so disposed as to receive the water; and time must be taken to render the cleansing complete. Some recommend a syringe; but the stream afforded by it is apt to be jerky and unduly forcible, and the small sponge is much to be preferred. When the washing is finished, the eyes must be very gently dried by the application of bits of soft absorbent rag, and then a drop of the nitrate of silver lotion should be suffered to fall between the parted lids. Finally, the margins should be anointed with cold cream or spermaceti ointment, to prevent adhesion from the drying of the discharge. The whole process thus described should be repeated about every four hours; and there will soon be sufficient evidence of improvement to allow of this interval being prolonged to six, eight, or even twelve hours. Within a week, the cure is complete. The surgeon should, as a rule, show the mother or nurse how the application is to be made. If he is content with mere description, the chances are that his directions will be very imperfectly followed.

Corneitis.—When the infant is syphilitic, or feeble and badly nourished, or the early stage of the disease has been neglected, the case may assume a very different aspect. The surgeon may find the cornea hazy, or superficially ulcerated, or deeply ulcerated, or sloughing; or the sloughing may be complete, and the lens and iris exposed. Haziness of the cornea may be superficial, affecting only the epithelium; or interstitial, affecting the deeper layers. In the former case it scarcely adds to the gravity of the condition; but in the latter it indicates a tendency to slough. It should be noted that a perfectly bright cornea may sometimes appear hazy, by being covered with a thin film of pus; but the sponge and water speedily dispels this source of error. Ulceration of the cornea, even if it does not lead to perforation, always leaves an opaque cicatrix; but such opacities are usually in great measure removed by time, and either do not ultimately affect vision, or at least leave a clear space behind which an artificial pupil may be made. Perforating ulcers leave indelible opaque cicatrices; and, if they are large, these cicatrices often yield to the intra-ocular pressure and become prominent, forming what is called partial staphyloma, and greatly impairing sight. When any considerable portion of cornea actually sloughs, the resulting cicatrix becomes the seat of complete staphyloma; and blindness is the ordinary result.

It may be laid down as a general rule that, in childhood, the cornea is the most important of the ocular structures—the one that is most frequently diseased, and that most frequently so suffers as to produce loss or permanent impairment of vision. Every grave affection of the cornea calls for the exercise of all the resources of the healing art, and requires the surgeon to give utterance to a very guarded prognosis.

In the case of the ulcerative or degenerative corneal affections which follow infantile purulent ophthalmia, our resources are very limited. The morbid action is, as a rule, a mere expression of cachexia or mal-nutrition. If there be syphilis, it is necessary to have immediate recourse to mercurial inunction. The conditions are too urgent, the dangers of delay are too great, to leave time for coquetry with chlorate of potash or other reputed remedies. In all cases inquiry must be made about the infant's sustenance; and, if the mother's milk be defective in quality or deficient in quantity, arrangements must be made for the employment of a wet-nurse, or for the best artificial feeding that circumstances allow. It will usually be desirable to give also some medicinal tonic and nutrient, and for this purpose the following formula will be found of especial value :—

℞ Olei Morrhuæ	fl. drs. 2.
Mucil. Acaciæ	fl. oz. ½.
Liq. Cinchonæ	min. 24.
Syrupi	fl. drs. 5½.

M. Take one teaspoonful three times a day.

The local treatment pursued must be the same as for the uncomplicated forms of the disease ; with the single addition that when a central ulcer exists, a drop of a weak solution of atropine should be put into the eye twice a day. From gr. ½ to gr. 1 of the neutral sulphate of atroprine to an ounce of distilled water will be a proper strength. By thus maintaining dilatation of the pupil, and keeping its margin away from the region of the ulcer, it is sometimes possible to prevent adhesions between the iris and the cicatrix.

Conjunctivitis.—The common form that occurs in later childhood is a very trivial affection. The membrane is highly vascular; there is a little gummy exudation sticking the lids together after sleep, and there is a little smarting or feeling of grittiness under the lids. The diagnosis from graver affections rests on the absence of graver symptoms. The transparency and brightness of the cornea are undiminished, and vision is not impaired. The treatment consists in the application of any mild astringent lotion. Sulphate of zinc, two grains to the ounce of water, and nitrate of silver, one grain to the ounce, may be taken as types of the class, and either may be dropped into the eye two or three times a day. Recovery will be speedy and complete.

Phlyctenular Ophthalmia.—Among the forms of conjunctivitis must be noticed that in which little inflammatory elevations are formed at various points of the ocular surface. If these elevations are few in number, and not very near the cornea, they occasion little irritation. They burst, and expose an ash-coloured surface, which usually quickly heals; but if they are numerous, or frequently recurring, or situated on the very margin of the cornea, they are apt to occasion a good deal of general vascularity, and sometimes a high degree of intolerance of light. In such cases it will usually be found that there is some manifest derangement of the general health ; the bowels being often torpid and loaded, and the secretions unhealthy. After such conditions have been corrected by appropriate treatment, it is often highly beneficial to give arsenic for a time, either alone or in combination with iron. The local treatment should at first be soothing. A little atropine solution may be dropped into the eye, and a compress, or a soft poultice, warm or cold according to the feeling of the patient, may be retained over the closed lids by a bandage. When the first irritation has subsided, a little perfectly pure dry calomel may be dusted over the eye by a camel's-hair brush, or a portion of Pagenstecher's ointment, already mentioned, may be placed within the lids.

Contagious Ophthalmia.—When large numbers of children are crowded together, as in workhouse schools, orphanages, and similar institutions, a contagious form of ophthalmia often becomes prevalent. It consists essentially of an inflammation of the conjunctiva, and in severe cases spreads to the cornea, where it may produce opacity or even sloughing and total destruction. When children that have suffered from this disease are examined, it will be found that in nearly all of them, even after apparent recovery, there remains undue conjunctival vascularity; and if the lower lid be drawn downwards, a number of granules, like grains of boiled sago, will be seen on its lining membrane, near the outer canthus and the fold of reflection on to the globe. As long as such conditions remain, the disease is only dormant, and may at any time return in full activity; while community of towels or pillow-cases, and the intercourse of the playground, may communicate it to all new comers.

Treatment consists in strict attention to cleanliness, the observance of all sanitary precautions, the local use of astringents graduated to the severity of the cases, and of suitable medicines to improve or sustain the general health. Notwithstanding all that can be done, this contagious or vesicular ophthalmia is always very obstinate and troublesome, and may cling to a school or other institution for years. Even in the mildest forms it is not harmless, for the vesicles are often replaced or followed by a contractile fibrinous exudation, by which the proper characters of the palpebral conjunctiva are liable to be much impaired.

Granular Lids.—Besides these vesicles, any prolonged superficial inflammation of the eye is apt to be followed, especially if astringent or caustic applications have been used in its treatment, by growths called granulations, which resemble exaggerated villi, and are found most abundantly on the lining membrane of the upper lid, near the upper margin of the tarsal cartilage. These granulations act as foreign bodies, and keep up the irritation in which they originated. Whenever an eye remains in a state of chronic vascularity and irritation, the upper lid should be inverted, and, if granulations are found, they should be made the chief subjects of treatment. They require the direct application of the milder caustics, such as diluted nitrate of silver, or diluted sulphate of copper, at intervals of two or three days, and often for many weeks or even months. The stick of diluted caustic should be applied to the granulations, and the surface should then be washed with water and a camel's-hair brush before the lid is suffered to return to its natural position. During the course of treatment it will be necessary to change the caustic from time to time, and to increase or diminish its strength, in accordance with the condition, progress, and variations of the case. The object of the application is to maintain a state of hyperæmia, under which the new formations in time become absorbed; and this result can be obtained with far more certainty in the young than in adults. The granulations must by no means be destroyed by caustic; neither must they be cut away, as the consequent cicatrization would be most mischievous in its results. Quite recently, Mr. Lawson Tait has recommended simple syrup as a curative application in such cases.

Diphtheritic Conjunctivitis.—Continental writers have of late years described a "diphtheritic" form of conjunctivitis, attended with a firm and pale brawny infiltration of the membrane, and tending to speedy sloughing of the cornea by arrest of its nutrition. The disease and its treatment will be found fully described in recent works on ophthalmology; but it is almost, if not altogether, unknown in this country.

The primary affections of the *Cornea* in childhood are all of the highest practical importance, and all require careful and skilful treatment. They present themselves under many aspects, but may be classified under the two heads of Keratitis, or inflammation of the cornea, and Ulceration.

Keratitis.—The principal objective *Symptom* of common keratitis is the presence of blood-vessels, encroaching upon what should be transparent cornea. These vessels are usually arranged in two arches, or crescentic patches, the one at the superior, the other at the inferior margin. The arches may meet at their terminations; and may either be very narrow, or so wide as nearly to cover the membrane. They have usually a line of turbidity in advance of the visible vessels, and, when this turbidity reaches the pupillary region, vision will be much impaired. Pain, and intolerance of light, may be present or absent, but are of no diagnostic value.

Syphilitic Keratitis.—Besides the common form of keratitis there is another or interstitial form, dependent upon inherited syphilis (and in some instances, we have had reason to think, upon syphilis communicated by vaccination). It differs from the first by commencing as a hazy patch in the centre of the cornea; and the marginal vascularity, although it often supervenes in severe cases, is always secondary. The patients present the aspect, and the notched incisor teeth, so well described by Mr. Hutchinson; and, although one eye is usually first attacked, both always suffer in turn. The disease is extremely obstinate and chronic, but tends to exhaust itself, and to terminate in spontaneous recovery after the lapse of weeks or months. It often leaves behind a permanent general haziness, not sufficient to attract much notice, but quite sufficient to be a serious obstacle to vision.

Ulceration of the Cornea presents three principal forms. It may be simple, sloughing, or vascular. The *simple ulcer* of the cornea occurs chiefly in young children, and may easily escape notice. It looks as if a piece had been cleanly cut or gouged out of the transparent tissue, and hence it can only be seen in certain lights, or by an oblique examination. It is surrounded (in its progressive stage) by no haze, and is attended by no increase of vascularity, but it may penetrate all the layers of the cornea and lead to perforation. The *sloughing ulcer* commences as a yellow speck, or circumscribed abscess, in the true corneal tissue, and is always attended by congestion of the conjunctiva, and surrounded by a halo of corneal turbidity. The pus makes its way to the surface, leaving an ulcer, and it may also gravitate between the corneal layers, forming an opaque film (the true onyx) which may be distinguished from *hypopyon,* or the presence of pus in the anterior chamber, by two principal tests—first, by examination of the eye in profile, when the aqueous humour may be seen, transparent, behind the pus; and secondly, by noticing that the upper border of an onyx ceases to be horizontal when the head is inclined to either side. The *vascular ulcer* has one or more vessels shooting across the cornea towards or up to its margin. The presence of these vessels is usually an indication that a process of repair has commenced, and hence they are always seen in the healing stages of the simple and sloughing ulcers They are seen from the beginning in a form called *fascicular keratitis* which is very rare in England, and also in the very common *recurrent vascular ulcer,* an affection which bears great resemblance to the already described phlyctenulæ, except that it is seated upon the cornea.

The consequences of inflammatory and ulcerative affections of the cornea are often extremely serious. Inflammation alone may permanently impair its transparency, or may soften its texture, and cause it to yield to intra-ocular pressure in such a way as completely to change its curvature, and thus to distort objects or to increase the refraction of the eye. Ulceration always produces opacity, and this opacity, though often greatly diminished by time, is probably never entirely removed. A large ulcer, or one centrally placed, can scarcely fail to affect vision very seriously; not only by the opacity, but also by the flattening of the corneal curvature that is always produced during cicatrization, and during the subsequent contraction of the cicatrix. Small ulcers frequently leave a flat cicatrix; and the "recurrent vascular" form may even change the cornea into a surface with absolute facets, by which the images of objects may not only be distorted, but even multiplied.

The first principle in the *Treatment* of corneal affections is, that only soothing applications are admissible in the early stages, and none but very mild astringents in the later ones. Caustics, which, more or less dilute, are invaluable in the purely conjunctival disorders, are sources of unmixed evil when the true cornea is implicated. It follows that in the early stages of an ophthalmia, if the surgeon be in doubt as to the character of the attack, he must confine himself to soothing treatment until all doubt is removed. An inflamed cornea should be protected from light, from wind, from atmospheric dust, from changes of temperature, and from the friction of the eyelids. In the adult these indications may be fulfilled by a compressive bandage, but in children it is best to secure the lids by a vertical strip of isinglass plaster, extending from above the eyebrow to the cheek. The plaster may be readily removed by warm water for the purpose of examination or for the application of remedies. Among these the first place must be given to atropine. A drop of a two-grain solution may be placed between the lids twice a day, and will not only tranquillize the sensory nerves, and allay pain, but, by paralyzing the ciliary muscle and the sphincter pupillæ, will afford perfect rest to the eye. A bread poultice made with a watery solution of opium, and applied to the closed lids over the plaster, will often be a powerful adjuvant: and this poultice may be cold, if congestion and irritation predominate; or hot if there be evidences of deficient reparative power. In the simple ulcer in feeble infants, and in the sloughing ulcer, it is proper in extreme cases to stimulate vascular action by very warm applications, such as poultices or compresses as hot as they can be borne, and changed at short intervals, until the appearance of a haze around the simple ulcer, or of vessels tending towards the sloughing ulcer, affords evidence that repair has commenced. In regulating the diet, and in practising or abstaining from careful local depletion, the surgeon must be guided wholly by the general condition of the patient and the degree of ocular congestion. But when the acute stage of common keratitis has subsided, or when the destructive stage of simple or of sloughing ulcer has subsided, a time comes in which the absorption of inflammatory deposit, or the formation of new tissue, may be advantageously aided by stimulants; and of all these there is none to compare with Pagenstecher's ointment. Next to it in efficacy may be placed dry calomel, and the two applications may sometimes be used alternately with advantage. In recurrent vascular ulcer one of them may be employed from the beginning, and will materially diminish both the severity and the duration of the attack.

The phenomenon of recurrence, however, apart from the treatment of the recurring malady, is one that merits careful attention. It can hardly be hoped that any recurring malady will fail each time to leave behind some traces of its attack; and hence the preventive treatment is of even more importance than the curative. The recurrence of corneal affections is mostly due to one of two causes: either it is periodic, and dependent upon conditions of which we only know that quinine relieves them; or else the cornea is simply the *pars minoris resistantiæ* on which every trivial indisposition falls. To meet the last and very common case, Mr. Critchett has advised the insertion of small setons in the temples. He believes that the stress of any casual indisposition will then fall upon them, and that the eyes will in time lose their habit of being inflamed. The practice is often followed by excellent results; but it offers the temptation of a short and easy substitute for the careful constitutional treatment that should precede more heroic measures. For patients who cannot have careful supervision it is often extremely valuable; but in private practice, although it is doubtless possible to be too reluctant to use the seton, it is also possible to be too ready.

The interstitial, or syphilitic form of keratitis requires the same local treatment as the common form, with the addition of remedies appropriate to late stages of syphilis, such as the iodides of potassium and iron. In one very severe case I used the iodide of methyl with much apparent benefit; but the tendency of the disease towards eventual recovery renders it impossible to found any deductions about the action of medicines on any but a large experience.

Besides medical treatment, there are certain conditions of corneal disease in which the operation of iridectomy will be productive of the greatest benefit. In large sloughing ulcers, inclining to rapid perforation, a sufficient iridectomy will often at once arrest the destructive process, and determine the commencement of healing; and it may usually be so planned as to leave a good opening behind healthy cornea, and to render unnecessary any subsequent operation for artificial pupil. In severe cases of keratitis, whether superficial or interstitial, leaving a dense cloud over the larger part of the cornea, an iridectomy will greatly hasten the absorption of this cloud, and will restore useful vision many months earlier than it would otherwise return. I have satisfied myself of this, in several cases, by operating on one eye only when both were equally affected; and among patients of the lower classes, to whom loss of time is more important than the trifling blemish of the coloboma, the operation should seldom be neglected in severe cases. The time for its performance would be at the close of the acute or irritative stage of the attack.

Iritis.—Proceeding backwards from the cornea, we next arrive at the iris; but this structure seldom suffers from disease until after puberty. In a few cases there may be syphilitic iritis in infancy; but this, very rare itself, is seldom recognized, except afterwards, by the adhesions it has left behind. The iris sometimes participates in the keratitis of inherited syphilis; and the margin of the pupil may often become involved in perforating. corneal ulcers, and adherent to the resulting cicatrix. In all these states, the prompt and free use of atropine would be indicated; and it is probable that primary iritis, if it ever occurred in a child, would yield quickly to atropine alone.

Defects of Vision.—Having thus passed in review the principal morbid conditions of the eye which produce marked objective changes in children, we may pass on to the consideration of some others that proclaim themselves chiefly by defects of vision.

Congenital Cataract.—We may neglect the cases in which total blindness has followed some severe disease, and in which the ophthalmoscope reveals atrophy of the optic nerves, and confine ourselves to those in which the sight is defective. A child who is certainly not blind is found, when he is old enough for such observations to be made, not to see objects quite clearly, or not readily to distinguish things between which there is a resemblance. Or, when attempts are made to teach him to read, he cannot identify the letters. In such cases there is usually congenital cataract, not milky enough to have been observed by parents in infancy, but enough to lower greatly the acuteness of vision. To demonstrate its presence the pupil must be fully dilated, and its area illuminated by a pencil of rays, focussed upon it by a convex lens. The faintest trace of cataractous turbidity will then be rendered clearly visible; but the treatment to be followed must depend upon the nature of the case. If the cataract be very small and central, it may be sufficient to maintain moderate dilatation of the pupil by atropine. If it be larger, but central and homogeneous, and surrounded by a margin of perfect transparency, it may be advisable to remove a small portion of iris, so as to give vision through the margin without the aid of an artificial lens. But if the opacity be radiating or striated, or if the margin be in the slightest degree cloudy, then it will all become opaque in time, and its early removal should be recommended. This may be accomplished either tardily by solution, or more rapidly by linear extraction, or by the suction method introduced of late years by Mr. Teale.

When congenital cataract is plainly visible soon after birth, and when parents bring an infant for advice because the pupils of its eyes are bluish white, an early operation, generally at about the age of four months, should always be practised. It is true that the retina of a cataractous eye does not suffer, and that the actual blindness may be cured at any age; but the want of vision in infancy deprives the muscles of the eyes of their proper stimulus to action, and they undergo a degeneracy which renders them ever afterwards incapable of fixing. The resulting condition is called *nystagmus*, and in it the eyeballs oscillate constantly to and fro, the range of excursion varying in different persons, but being always enough to place a great obstacle in the way of the proper definition of objects.

In a young child with imperfect vision, if the illumination described fails to discover any cataractous opacity, it becomes necessary to have recourse to the ophthalmoscope. This instrument may reveal various morbid conditions of the deeper tunics—conditions of which the results of intra-uterine *syphilitic choroiditis* may be taken as an example. The recognition and treatment of such affections would usually devolve upon the special ophthalmic surgeon.

Tubercular Diseases and Glioma retinæ.—It will sometimes happen that a child is brought to the surgeon on account of recently discovered loss of the sight of one eye. If the parents are observant, and early notice that the child has a blind side, they may perhaps observe nothing else. If they delay, they may possibly notice that the pupil displays an unnatural colour—that it is yellowish, or whitish. Such cases have even been mistaken for cataract. The surgeon will probably find the eyeball tense and hard, the pupil dilated, and vision quite destroyed. By focal illumination, or by the use of the ophthalmoscope, he will discover the presence of a new growth within the eye In some instances this growth may be tubercular, and it may lead to no further mischief. In most it is malignant, and is the medullary cancer of older writers, the glioma retinæ of the present day. In either case the eye is lost as an organ of vision; and, in the latter, its early removal affords the only hope of escape from a miserable death. The eye is so isolated an organ that it permits, before the optic nerve has become implicated, of the complete removal of cancer, and thus justifies a hope that it may not return. Dr. Hirschberg, the latest writer upon this subject, has obtained records of seventy-seven cases, in five of which no return took place after operation. In one of the five Mr. Lawson was the operator; and the patient has since been under observation, and in perfect health, for more than ten years.

Hypermetropia and Astigmatism.—At the age of ten or twelve years, or earlier, it is not uncommon for children to be impeded in their school work by defective vision, so slight as previously to have escaped notice, but sufficient to make the eyes painful, and to be a barrier in the way of close application. Such difficulties may depend upon a very slight cataractous haze, or upon the scarcely visible remains of corneal opacity from bygone inflammation or ulcer, or upon pigmentary retinitis, or other deep-seated changes. All these conditions are readily displayed by the aid of focal illumination and the ophthalmoscope. If none of them are discoverable, the fault is probably in the refraction, or shape of the eyeball; and the most common faults of this kind are flatness of the eye, the hypermetropia of Donders, or a difference in its curvature in different directions, producing what is called astigmatism. As a rough test for the first, the child may be put to read in his grandfather's spectacles, and, if they relieve him greatly, the diagnosis of hypermetropia may be pronounced with some confidence. If they relieve him but slightly, his vision should be tested for lines drawn in different directions, horizontal, vertical, and oblique; and if it be found that lines in one direction are more clearly seen than others, and especially more clearly than those at right angles to the first, the cause of the defective vision will be astigmatism. In either case appropriate spectacles will be required, and will in great measure correct the defect. The principles and rules for their determination must be sought in books specially devoted to the subject, and among these the great work of Professor Donders holds the foremost place.

Strabismus.—Intermediate between the conditions that have hitherto been described, in that it presents a marked objective character, and yet is a direct result of a defect of vision that cannot be recognized by superficial examination, comes the deformity known as *Strabismus* or *Squint*. Short-sighted adults sometimes contract a divergent squint; and an eye blinded by disease or accident is apt to diverge from its fellow; but the squint of childhood may be said, almost without exception, to be of the convergent kind, and to be due to hypermetropia. It first appears at the age when attention begins to be directed to near objects; and it is at first intermittent, but soon becomes permanent and confirmed. The limits of space do not permit any account of the mechanism of its production, for which the reader must have recourse to treatises on ophthalmology.

Treatment.—The cure of squint is effected by the operation of dividing one or both internal recti muscles at their point of insertion into the eyeball. The operation is theoretically very easy, and is actually easy when only rough results are desired. But to obtain perfect results—that is to say, perfect harmony between the eyes, and perfect binocular vision, with preservation of the caruncle—is a matter requiring no common degree of skill, special knowledge, and practical experience.

A few years ago, before the causes of convergent squint were understood, the question of the best time for an operation was much debated, but is now entirely set at rest. If an operation be performed early in life the squint will return unless the hypermetropia be corrected by spectacles. It is, therefore, undesirable to operate before spectacles can be constantly worn—that is, before the age of nine or ten years—unless the squint is doing mischief to the eye. It begins to do mischief as soon as it becomes permanent, because the image of the squinting eye is then habitually suppressed, to avoid the embarrassment of double vision, and the retina suffers from what may be almost called active disuse. Hence, as long as a young child's squint is intermittent or alternating, and either eye can be used equally well, the operation may be deferred without injury. As soon as the squint is constant, and the perfect eye becomes the seeing eye for all purposes, an operation should be performed; but in early childhood its effect will seldom be either perfect or permanent. It will render the deformity less apparent, and will save the squinting eye from disuse. If a better result be ultimately desired, a second operation must be performed at a later period of life, when spectacles can be worn if their use should appear to be desirable.

INJURIES OF THE EYE.—The injuries that may happen to the eye in childhood do not present any features of special interest, except that they are better borne, and more completely recovered from, than at a more advanced age. The crystalline lens in childhood, by reason of its softness, is readily absorbed if punctured; the iris is little prone to inflammation; and incised wounds of the cornea heal readily, leaving insignificant cicatrices. These circumstances justify a more favourable prognosis, after injuries, than could be ventured upon in the case of adults, and suggest a *Treatment* chiefly expectant, or addressed to the exclusion of injurious influences. Rest and soothing applications are always indicated. If the cornea be wounded near its centre, or if the lens be wounded, atropine should be freely used, so as to keep the pupil out of the way of the injury. If the cornea be wounded near its margin, and a portion of iris protrudes, the protrusion may sometimes be reduced by the action of Calabar bean. If a shot, or any larger foreign body, should be lodged within the eyeball, its extraction should be effected whenever practicable; and if it cannot be extracted, the eyeball itself should be promptly removed, so as to anticipate and prevent the occurrence of *sympathetic ophthalmia.*

Incised or lacerated wounds about the eyelids and orbital region should be so treated as to obtain the smallest possible cicatrix. For this purpose they should usually be brought together by numerous sutures, for which very fine platinum wire, as fine as hair, is perhaps the best material. It excites no irritation, and may be passed with the finest common needles, such as are used for threading small beads, and are sold as beading needles. They should be grasped about the middle, or somewhat nearer the point, by suitable forceps, and drawn through by forceps when the counter puncture is made, as they are otherwise liable to snap. When the wound is perfectly united by such sutures, it may be covered with collodion or styptic colloid, and the wire left undisturbed for some days unless inflammation should set in.

In conclusion, it seems desirable to call attention to the fact, fully established by the laborious researches of Dr. Cohn, that a large amount of disorder of the visual apparatus may be directly traced to preventible causes operating during childhood. Chief among these may be placed a habit of reading or working by imperfect light —whether this depend upon the faulty situation or construction of school-rooms, upon imperfect artificial lighting, or upon efforts to read "between the lights," or by firelight. Under all these conditions the object is brought very near to the eyes, in order that they may receive from it as much light as possible; and this position involves a high degree of sustained convergence, by which, in some cases, *myopia* is mechanically produced by the traction upon the eyeball, and in others the muscles of convergence become wearied and weakened, and unable to sustain even moderate exertion. Parents cannot be too careful to see that school-rooms are well lighted, and that reading by dim or fading light is totally forbidden. Evils similar in kind, but somewhat less in degree, are produced by the habitual use of very small type, and by school desks that are too low, and too far away from the seats, so that children are compelled to bend their backs over their work. Good bold clear type, and a tolerably erect position of the chest and head, are desiderata that are well worthy of being secured, even at the cost of some trouble to practical educationists.

CHAPTER VIII.

DISEASES OF THE EAR.

THE diseases of the ear which are most commonly met with in children, and to which alone, therefore, in a work like this, we need direct attention, are, acute and chronic inflammation of the external or internal ear, including both the hard and soft structures, neuralgia, or otalgia, as it is called, foreign bodies in the meatus auditorius, and deaf-dumbness.

We will consider these affections in the order enumerated above: and first with regard to *Inflammation of the Ear* (*Otitis*); this may affect the external and internal ear at the same time, or it may be confined to either, and in the case of the former it is generally the skin merely which lines the external ear which is the part affected.

I. OTITIS

ACUTE EXTERNAL OTITIS may be brought on by cold, by the accumulation of cerumen, by the presence of foreign bodies in the passage, or by some constitutional condition.

The *Symptoms* of acute inflammation of the membrane lining the meatus auditorius externus, are, first a sense of fulness, with dryness, itching, and heat of the part, gradually increasing to a dull aching, and eventually to an acute pain, which is severe when the ear is pressed upon, though never so severe as the pain of internal inflammation. It is generally increased at night, sometimes causing great agony, sleeplessness, fever, and even delirium. The lining of the meatus is swollen, and this perhaps accounts for the occasional diminution of the power of hearing, it is also at first dry and pinkish; but in a short time a thick muco-purulent or purulent discharge takes place, which ultimately becomes thin and watery: it is often very profuse in quantity, and then relief is experienced. Attendant upon these symptoms and appearances, there is a sensation of soreness of the head, and the child buries its face in the pillow upon the affected side; while sneezing, moving the jaw, &c., increase the suffering. Sometimes the inflammation extends to the internal ear, and it may even involve the parts within the skull, giving rise to severe and even fatal inflammation of the membranes of the brain.

CHRONIC EXTERNAL OTITIS may result from the foregoing, or it may come on gradually, and without any acute beginning, as the result of bad health, especially in the scrofulous subject, or as a sequela to measles, scarlatina, &c.

The *Symptoms* resemble those above described, but are much less severe, the pain is very slight, and there is but little constitutional disturbance. The membrane lining the meatus is thickened and red, rather as a result of the acrid discharge which flows from the ear. Sometimes there is little or none of this, but in place of it masses of thickened and indurated epidermis, which are shed by the inflammatory process. Sometimes, when of long standing, the deeper parts of the ear become involved, the morbid action reaches the tympanum, and deafness is a more marked feature. The discharge is often very offensive and irritating, and the glands of the neck frequently inflame, enlarge, and become very painful.

Like the preceding, this form of inflammation may extend to the tympanum and thence to the brain itself, but it is a rare occurrence unless there be disease of bone as well, or unless the case be neglected, and so the mischief be allowed to spread. Toynbee pointed out long since that the presence of pent-up matter might lead to mischief within the ear, and so reach the cavity of the skull.

INTERNAL OTITIS, or inflammation of the lining membrane of the cavity of the tympanum, is sometimes a very severe disease, being generally combined with inflammation of the membrana tympani — *Myringitis* of Wilde. Though frequently a disease of youth, it may occur at any time of life: cold is a frequent cause of it, especially in debilitated or strumous individuals.

Inflammation of the internal ear commences with *Symptoms* very much resembling those above described, but they are more severe at the outset, and are commonly attended with violent headache, tinnitus aurium, and impaired hearing; followed soon by intense, acute, gradually increasing pain in the ear, and loud beating noises; after a short time a sense of bursting or distension in the ear is experienced. The eyes become injected, the countenance anxious, the skin hot, pulse frequent, and the functions of the kidneys and bowels are disordered. Delirium is often present; with convulsions in children. Many of the violent fits of screaming with which children awake out of sleep are caused by inflammation of some part of the internal ear, and especially of the mucous membrane of the tympanum. A sudden accession of excruciating pain in the middle of the night is a frequent symptom of this affection, even when it exists in a subacute or chronic stage. Facial paralysis, caused by the inflammation extending to the bony canal in which the portio dura passes round the tympanum, may occur. The disease terminates in one of three ways: either by resolution, the symptoms gradually subsiding, and hearing being restored; or by suppuration, the pent-up pus bursting through the membrana tympani, and so discharging itself; or by the inflammatory process spreading either through the mastoid cells internally, and so producing necrosis, exfoliation, and cerebral disease, or extending externally by the bony meatus to the periosteum covering the mastoid process.

Peculiar forms of otitis have been well described by Mr. Harvey, such as the rheumatic and gouty, which, however, need only be here mentioned: as well as exanthematous otitis, which, according to Mr. Wilde, frequently follows scarlatina and measles, and if neglected gives rise to unmanageable otorrhœa, destruction of the ossicula, incurable deafness, and even loss of life. Dr. Theophilus Thompson has recorded in the *Transactions of the Pathological Society*, vol. vii. p. 16, an interesting case of gangrenous abscess of the brain induced by exanthematous otitis. The patient had been affected with deafness and discharge from the right ear, the result of scarlatina, for more than twenty years. All at once violent sickness came on, followed in a few hours by coma, and death. The case is remarkable for the long continuance of the disease of the ear before it extended to the brain, for the insidious way in which serious disease of this organ involved the brain, and for the suddenness of the fatal issue after the first occurrence of alarming symptoms.

Otorrhœa is a term which is applied to a purulent or muco-purulent discharge from the ear, and is, properly speaking, only a symptom of certain diseases of this organ; it occurs in the course of inflammation, of polypus, of granulations on the surface of the membrana tympani, and is a constant accompaniment of chronic catarrhal inflammation of the tympanic mucous membrane. It also occurs very frequently, however, without any appreciable cause, in young children—especially in strumous subjects—about the time of dentition, or on the subsidence of any of the exanthemata, or on the sudden cessation of purulent ophthalmia. It is commonly neglected, or treated with purgatives, and any " drops " that the fancy of the nurse suggests: no proper examination is made until a loathsome, obstinate discharge is established. Then that which might have been cured in a short period by appropriate treatment, becomes a chronic affection; in which case it may continue for years, destroying in course of time the membrana tympani, the ossicula auditûs, and producing caries of the bony walls of the meatus and tympanum. The disease may even extend to the cells of the mastoid process of the temporal bone; or in the opposite direction along the petrous portion of the same bone, until the brain and its membranes become involved, when rigors, fever, and marked cerebral symptoms show themselves, and the case ultimately terminates in convulsions, coma, and death. " In chronic catarrhal inflammation the tympanic mucous membrane becomes much hypertrophied, and its vessels enlarged; and as these vessels are, through the medium of the bone, directly continuous with those of the dura mater, it is not surprising that the latter membrane should be affected." (Toynbee.)

Treatment.—The treatment of the various inflammatory affections of the ear which we have been considering varies only in regard to the severity of the attack, and to the consequent need for the employment of what are called active remedies: regard must also be had, however, to any constitutional peculiarity, and specially with reference to any strumous, syphilitic, or tubercular taint; where these exist, the treatment must be mainly guided by their consideration. On this point the reader may refer to the chapters treating of these conditions.

Chronic inflammation of the ear will best be managed by remedies which aim first at improving the general health; secondly, at securing a free exit for any matter which may form in the ear; and thirdly, at reducing the inflammation; in other words, at altering the morbid processes which are going on there. Fresh air, good food properly administered, tonics, and general hygienic management are the principal points to be remembered under the first head. The second may be helped by care and cleanliness, by frequent washings and injections, and by not allowing the meatus to be occluded by hardened matter. As regards the last point, counter-irritation, is often of great use; an issue, seton, or open blister behind the ear will frequently be useful. In obstinate cases of so called otorrhœa, mild and warm astringent lotions will also do good, and a weak solution of iodine, one or two drachms of the tincture to six fluid ounces of water, has proved of great service in our hands, especially where, as has often happened, the discharge was at the same time rather offensive. Carbolic acid lotion may also be used for the same purpose: either of these lotions may best be used by means of a piece of cotton wool soaked and kept constantly applied to the ear.

In acute inflammation, on the other hand, the treatment must be prompt and decided. In cases where the fever runs high, and the suffering is acute, antimony in slightly nauseating doses seems to have the effect of lowering the pulse and of reducing the inflammation; alterative doses of mercury may also be administered; and active purgatives may be necessary; the patient should also be restricted to low diet. All this, however, applies only to cases in which the inflammatory or irritative fever runs high, and where there is no constitutional taint; this latter point is of great importance in all cases where the administration of lowering remedies is contemplated. Hot fomentations should be sedulously applied, and poultices with linseed meal, to which may be added twenty or thirty drops of laudanum; holding the ear over the steam of hot water also gives relief. Where the pain and constitutional disturbance are severe, the pulse quick, full, and bounding, and the symptoms, both general and local, indicate acute inflammation, the application of one or two leeches to the meatus or behind the ear will often do great good: it gives immediate relief to the pain and tension, and being followed by the continued application of hot fomentations or poultices, has a wonderful effect in subduing the inflammation. We must always bear in mind, in treating these cases, that the inflammation now and then extends beyond the internal ear to the membranes of the brain. The *prognosis* should therefore always be a guarded one in all the more severe cases. The supervention of delirium or convulsions is a sure indication of the extension. On the subsidence of the acute symptoms, counter-irritation behind the ear may be useful.

Should the pain and febrile disturbance continue, both Wilde and Harvey recommend that a free incision be made over the mastoid process, down to the bone; this proceeding is especially needed, if it can be determined that pus has formed under the periosteum, or if it be thought that the inflammation has extended to the osseous tissue. When the membrana tympani has been ruptured, the inconvenience which arises may in part be subsequently obviated by the application of a thin layer of moist cotton wool as was recommended by Mr. Yearsley, or by the use of an artificial membrane as suggested by Mr. Toynbee.

In the management of the so-called cases of *otorrhœa*, the first step must be to syringe, and then to carefully examine the meatus auditorius externus by means of an ear speculum. A simple conical silver tube, well polished internally so as to reflect the light, is the simplest and best form of instrument. If the discharge be not severe, and no cause, as polypus, &c., be found to account for it, a cure may often be effected by daily dropping into the ear a solution of alum, zinc, or tannin, of the same strength as the various collyria (gr. 4—10 to oz. 1). When these means fail, the surface of the canal should be painted with a solution of nitrate of silver (gr. 6 ad oz. 1) with a camel's-hair pencil: this should be repeated every second day, the ear being frequently syringed in the interval with tepid water by means of an elastic bottle, or common syringe. The application of glycerine, as recommended by Mr. Thomas Wakley, may also be beneficial after the use of the astringents. Where the patient's general health is bad, tonics and change of air will be necessary; in scrofulous cases iodine, cod-liver oil, &c., should be tried; and in all instances a generous diet is necessary.

No mischief whatever can ensue from curing either recent or long continued otorrhœa, as was at one time—and is still by the vulgar—feared. The evils which result in these cases are due to their being neglected; and most of all to the discharge being allowed to accumulate within the ear by the outer opening becoming closed; hence the common opinion that to stop the discharge is mischievous; it is so only when it is stopped by retention within the tympanic cavity; no harm, but good, will result from stopping its formation, so long as what is formed is allowed free exit, and as long as a discharge of this kind is present, we never can tell how, when, or where it will terminate, or what serious disorganization it may lead to.

II. OTALGIA.

OTALGIA, or earache, may be *Symptomatic* of inflammation of the ear, of the presence of foreign bodies, of tonsillitis, of disorder of the *primæ viæ*, of rheumatism of the head, &c.; or it may be idiopathic, that is to say, a true neuralgia of the ear. In the latter case, the pain is most severe on its invasion; and unlike the pain in *otitis*, it does not increase in severity, is unattended by fever, and often disappears suddenly. When the pain is very severe, it frequently shoots through the nervous filaments distributed over the same side of the face and head, causing much suffering and restlessness. When the affection is symptomatic, the *treatment* must be directed to the primary disease; when idiopathic, mild purgatives, a blister behind the affected ear, or the application of chloroform, or the tincture of aconite, will be useful. Any carious teeth must be extracted or stopped, and those medicines denominated nervine tonics should be given; the citrate of iron and quinine; iodide of iron; bromide and iodide of potassium, are those which, according to our experience, are most to be relied upon. We have often found that a few drops of chloroform on cotton wool applied to the ear gives very marked and speedy relief; it has the negative merit of being perfectly safe in its administration.

III. FOREIGN BODIES IN THE MEATUS AUDITORIUS.

Children not unfrequently contrive to push various foreign substances, such as peas, beads, grains of corn, pieces of slate pencil, of wood, &c., into their ears, and generally they become a good deal alarmed when they have made the discovery that they cannot remove them. In the management of such a case great tact and skill is often required, and though fear will generally be sufficient to induce a child to confess what it has done, the practitioner must not be content with this statement, nor rely too much upon it, but should make a most careful examination to satisfy himself of what is really present, for it now and then happens that the foreign body drops out again, though the child is ignorant of it. The importance of this examination is seen by the remark that, "for want of this pre-inspection lives have been destroyed in attempting to extract from the ear imaginary bodies which had never lodged there."

If, however, the examination results in the discovery of some foreign material, the sooner it is removed the better. Sometimes the use of a warm water injection will be sufficient for the purpose, provided that a fine mouthpiece be used, so that the stream of water may with some force be thrown behind the foreign body, and it be thus expelled. If this fails, then a small scoop or curette may be employed, but the utmost care will be necessary in the use of any of these means, to avoid injuring the meatus, and still more the membrana tympani, by forcing the foreign body against it. Cases are recorded in which severe injury and subsequent inflammation have followed these attempts, death even having resulted, and sometimes paralysis of the portio dura nerve. In some cases, a pair of small forceps will succeed better than anything else. In any event, if we are not successful at first, it is better to wait awhile, and by warm, soothing, emollient and sedative applications, to subdue as far as possible all irritation and inflammation before resorting to another attempt.

An accumulation of hard, dark brown wax in the auditory passage sometimes act as an irritant, causing uneasiness, buzzing, and deafness. It may be dislodged by careful syringing with warm water; or if firmly adherent may be lifted away with the curette, all rude force being avoided.

IV. DEAF-MUTISM.

Although the subject of deaf-dumbness is not usually treated of in works like the present, yet we trust that the importance and interest which naturally attaches to this most deplorable of human calamities, may plead as sufficient excuse for introducing a few remarks on the subject. It can hardly be necessary to observe that the incapacity of speech which exists in such as are designated deaf and dumb, results entirely from the want of the sense of hearing, and not from any physical imperfection in the organs of speech. All who are deaf from birth must be dumb; for how can they use language, the sound of which they have never had the perception of, and which they consequently cannot attempt to imitate?

By the census of 1851 in Great Britain, 12,553 persons (6,884 males and 5,669 females) were returned as deaf and dumb, or one in every 1,670 of the inhabitants. According to the most recent returns, the average proportion of the deaf and dumb to the population of Europe generally, is found to be one in every 1,598 persons. Deaf-mutism is also found to be more common in agricultural and pastoral districts than in towns.

Causes.—In some cases there has been no appreciable organic defect; in others the cause of the deafness has been, either some organic change in the auditory nerves, or some lesion at their origin, an alteration at the base of the brain, or about the medulla oblongata, an effusion into the fourth ventricle, or imperfect development of the ear itself, or disease of the ear occuring during early infancy. The late Mr. Toynbee remarks that "it would be no very violent assumption to suppose that early derangement of the nervous apparatus is at the root of most of the instances of deaf-mutism." Some authorities also assert that many of the cases of deaf-dumbness originate in convulsions occurring during the first dentition.

Of 411 cases observed by Toynbee, 313 were congenital and 98 were the effect of disease acquired subsequent to birth. Of the latter, 36 resulted from scarlet fever, 23 from fever, 4 from measles, and 35 from various other diseases, teething, convulsions, hydrocephalus, &c. Of the total number of cases, in 214 some abnormal appearance was discovered, though in many it was very slight, and 197 were perfectly healthy to all appearance.

Treatment.—Children who are born deaf differ but little from other children during early childhood; and it is not usually until a rather advanced period that the parents will allow themselves to be convinced that there is a positive defect of hearing in one who is, probably, very engaging and affectionate, and who—from the expressive play of his features and the readiness with which he apprehends the slightest look or gesture—has perhaps been regarded as more than ordinarily intelligent.

As regards the actual treatment of the deaf and dumb, one of the first questions to determine is, whether or no there exists any, and if any what, amount of hearing power: for it must not be supposed that all cases are equally deaf; on the contrary, the degrees of hearing vary a good deal. When the deafness is absolute, then nothing whatever can be done to develop it, and the sooner the parents of the child thus afflicted recognize this, and bestir themselves to its education as a mute, the better.

Where, on the other hand, some hearing power, however slight, exists, attempts should be made by the use of hearing trumpets to develop it, sounds being of the nature of stimulants to the auditory nerve. And though we have had no experience with galvanism in these cases, it seems quite reasonable to suppose that some good might result from a very moderate and gentle use of it. Moreover, something may also be done for cases where deafness has occurred subsequent to birth. Thus, Toynbee remarks,—"In cases where by disease subsequent to birth, either the membrana tympani, or the mucous membrane lining the tympanum, has been thickened, counter-irritation over the mastoid process will aid the use of trumpets; and in those where the membrana tympani has been partially or wholly destroyed by ulceration, and where there is a constant discharge of mucus from the surface of the tympanic mucous membrane, it is desirable for the ears to be syringed occasionally with a weak astringent, so as to prevent the membrane becoming ulcerated, and the bone which it covers carious. The artificial drum may also be resorted to."

Further experience having shown the complete impossibility of curing the great majority of these cases of deafness, it becomes a matter of the utmost importance to commence the education of the other senses as early as possible; so that the hapless being who is debarred from the chief avenue to knowledge at the most critical period of his intellectual growth may, nevertheless, not remain altogether uneducated. The system of instruction for deaf mutes consists of:—1. *Pantomime*, which may be divided into the employment of such natural, imitative, or descriptive signs or expressions of thought by gesture and pantomime as all mute persons acquire; or those arbitrary and conventional signs used by teachers and others in the habit of communicating with the deaf and dumb. The former are common to all mutes, and vary but little; the latter are generally founded upon some special plan, the method of one teacher differing from that of another—all of which shows the necessity of adopting some universal system by which the mutes of countries speaking different languages may communicate their ideas. The use of pictures, models, and similar illustrations may be classed under this head. 2. *Dactylology*, or finger-writing by either the double or single-hand alphabet; the former being that chiefly taught in this country; the latter, that used on the Continent, in America, &c. 3. *Writing and Reading*. 4. *Lip-reading*, by which a mute understands what is said by merely watching the motions of the lips of a speaker; those, however, who acquire this faculty being generally such as heard and spoke originally, but who, by accident or disease, have become totally deaf and subsequently mute. 5. *Articulation*, or the pronunciation of words and sentences. To what extent the true congenital deaf person can ever be taught to speak is still undetermined—only a few of the most intelligent and anxious are at all capable of such teaching, and even in these, the effort at vocalization is, from want of hearing, harsh and inharmonious, and seldom turned to much account in their intercourse in life. In most of the schools of this country, this system has been abandoned; the teachers conceiving that the time spent in acquiring this mechanical form of speech may be more usefully employed in other descriptions of education.

As regards the industrial education of deaf mutes, it is only necessary to say that they are probably as capable of acquiring a practical knowledge of the mechanical and industrial arts, as hearing and speaking persons in their own rank of life.

Note.—The system of instruction given above, is taken almost verbatim from the Appendix to Mr. Wilde's treatise.

PART IV.

ACCIDENTS, INJURIES, AND DEFORMITIES.

CHAPTER I.

ACCIDENTS AND DISEASES CONNECTED WITH BIRTH.

I. STILL-BORN CHILDREN—APNŒA NEONATORUM.

INFANTS are occasionally born in a state of apnœa, or of apparent death; to recover them from which very prompt and skilful attention on the part of the accoucheur is necessary. The term apnœa (from *a*, priv., and *πνεω*, *spiro*) is a great improvement over that of asphyxia (from *a*, priv., and *σφυξω*, *pulso*). The one signifies want of respiration, and almost suggests artificial respiration as the remedy; while the other means want of pulse, and teaches nothing, or, if anything, that the circulation has ceased, and consequently that attempts to excite respiration will be useless.

Causes.—This condition may result from many causes; the most common are the following: (1) a natural feebleness of constitution which exists to such a degree that the infant is incapable of making the muscular exertion necessary for the commencement of respiration: (2) the existence of some obstruction to the flow of blood through the umbilical cord during labour; as when the cord is twisted round the neck of the infant or some other part of its body, or when, from prolapsus, it is subjected to pressure between the head of the child and the walls of the pelvis: (3) the premature separation of the placenta—*i.e.*, before the birth of the child: (4) too great or too long continued compression of the head, either by the forceps or by an obstacle in the pelvis: (5) the presence of a collection of viscid mucus in the mouth and fauces preventing the entrance of air into the bronchial tubes and pulmonary air-cells: (6) a cessation, from some unexplained cause, of the proper functions of the placenta shortly before birth, by which, through the impeded depuration of the blood, the nervous system is deprived of its necessary stimulus: (7) and lastly, the unsuccessful efforts of the fœtus in utero to breathe or cry, as demonstrated by the presence of the liquor amnii in the bronchi.

Symptoms.—These may be classified under two heads: (1) those in which the muscular system is not much affected; and (2) those caused by feebleness, loss of blood, &c. In the former there is a degree of muscular resistance, the surface of the body is warm, and generally of a livid red colour, the conjunctivæ are more or less red, the heart and umbilical arteries pulsate slowly, and the vessels of the funis are distended with blood: in the latter the child's limbs are relaxed and motionless; the skin cold, pale, and sallow; the lips flaccid, and the lower jaw depressed; and the pulsations in the funis are so feeble that they can sometimes hardly be distinguished. An effort may be made to breathe or even cry, but from want of strength the child falls into a state of apparent death. In other instances in which the brain has become congested from some obstruction to the flow of blood—apoplectic apnœa—the countenance is purple and bloated; the body hot, swollen, and plethoric; the limbs full and flexible; and the pulsations of the cord strong and hard. The heart is probably the *ultimum moriens;* and in neither class of cases does its action cease, although the pulsations are generally so feeble that they can only be detected by careful auscultation. As long, then, as the heart continues to beat, however feebly or irregularly, so long is there a reasonable prospect of our being able to excite respiration, and so long must we persevere in our attempts, even if we have to continue our exertions for two or three hours; but when the heart's action has once stopped, owing to the suspension of respiration, it can never be restored. New-born children are very tenacious of life; and many cases that have at first sight appeared hopeless have been saved by careful management.

Treatment.—The mouth and throat should first be cleared from all obstructions with the little finger. An attempt should then be made to excite respiration by blowing in the face, by exposing the surface to cold air, by douching hot and cold water alternately over the thorax, and by smartly slapping the buttocks and back. Desormeaux recommends the accoucheur to fill his mouth with brandy and discharge it forcibly against the infant's breast; a process which it is rarely necessary to repeat more than three or four times, since, in instances where success is likely to follow, a convulsive contraction of the inspiratory muscles is almost immediately produced, the blood and air penetrate the lungs, and the respiration is gradually and fully established. Supposing all these attempts fail, there are three plans to be adopted for the production of artificial respiration—viz., the "Ready Method" of Dr. Marshall Hall, the "Silvester Method," and the "Howard Method."

The Marshall Hall or "Ready Method" is performed as follows: —Plunge the body into a hot and cold bath alternately. The temperature suggested is from 98° to 102° Fah. for the hot, and from 50° to 60° for the cold bath. The immersion should be momentary; the alternation quick. If respiration be not at once established. proceed without delay to place the infant in the *prone* position, and make gentle pressure on the back; this will secure a good expiration. Then withdraw the pressure and turn the body *on its side and a little more;* this will be followed by a good inspiration. If this pronation and pressure, and this removal of the pressure and rotation be instituted *alternately*, there will be good respiration established. These measures are to be repeated gently, deliberately, and most perseveringly at least twenty times in the minute; at the same time the limbs are to be rubbed, with slight pressure, upwards, to promote the circulation by propelling the venous blood towards the heart.

The "Silvester Method" is performed thus:—"An inspiratory effort is produced by extending the arms upwards by the sides of the head, or restoring them to their original position by the side of the body, or, still better, by pressing them on the lower third of the sternum; the expanded walls are allowed to resume their previous state, and expiration takes place, the quantity of air expelled being in proportion to that which had been previously inspired." We have on many occasions resorted to this method, and have found it remarkably successful. The process as above described is to be repeated not less than twenty times in the minute, and if the heart be pulsating, we ought not to give up hope of a successful issue even if half an hour or more be expended in the process. Sometimes plunging the child alternately in hot and cold water will greatly facilitate this, as it does the "Marshall Hall Method."

The *continued* warm bath is most injurious; since warmth shortens life in apnœa.

The "Howard Method" is performed thus:—"The child is made to rest along the left hand of the operator, the base of whose thumb adjusts itself to the hollow of the spine, and thus throws the chest forwards. The head and shoulders and arms fall back over the operator's left wrist. The buttocks and thighs are supported by the fingers. The right hand grasps the prominent thorax, and with firm counter-pressure behind, the operator can apply, locate, distribute, direct, and alternate the pressure as he pleases. The pressure is to be directed upwards and inwards towards the diaphragm.

In *Apoplectic Apnœa*, which is characterized by great congestion of the head and face, the latter being often livid and bloated, the eyes projecting, and the lips blue, it may sometimes be advisable, when the congestion is very great, to divide the umbilical cord before tightening the ligature, so as to allow a spoonful or two of blood to flow from the child's body. The loss of blood, however, is not to supersede either of the "Methods" above described, but rather to aid them. Should general convulsions occur, great care will be required to save the child's life: the warm bath with cold to the head, sinapisms to the feet, and purgatives administered until the meconium has all come away, are the remedies we must employ.

When the function of respiration has been with some difficulty established in weakly infants, portions of the lungs—especially the margin of the bases, the tongue-like prolongation of the left upper lobe, the middle lobe of the right lung, and the back of the upper and lower lobes on both sides—are liable to remain solid and unaërated, giving rise to the condition known as ATELECTASIS, from ατελης imperfect, and εκτασις expansion. An infant so affected seems often to have been rescued from speedy death only to die more slowly; it is often jaundiced; it utters a weak whimper or cry; it can scarcely suck; it remains very feeble and drowsy; the surface of the body is cold; and the chest is but slightly dilated by the hurried, imperfect respiratory movements. After the lapse of a few days, or perhaps weeks, the child either becomes, though very gradually, stronger, the paroxysms of dyspnœa materially lessen, and good health is attained; or, in less fortunate cases, the symptoms are aggravated, convulsions occur, and death ends the sufferings. To avoid this latter termination we must keep the infant well wrapped up, in a warm room; he should be put in a hot bath—100° Fah.—for five minutes, once or twice a day; stimulating liniments should be rubbed over the thorax and spine—F. 159; stimulants of ether and ammonia should be administered—F. 256 or 258, and these followed afterwards by some preparation of cinchona—F. 274. A mild emetic of ipecacuanha may occasionally be given, if the air-tubes seem obstructed by any mucus; and lastly, if the exhaustion is too great to admit of attempts at sucking, the mother's milk must be drawn off, and given to the child by means of a spoon.

II. INJURIES RECEIVED DURING BIRTH.

In difficult and tedious labours the infant may be bruised, or otherwise injured, from the long-continued pressure exerted upon its body, or from the use of instruments. In face-presentations particularly the features of the new-born child are often swollen, much disfigured and distorted by convulsive movements; but in a few days the parts assume their natural appearance, and the convulsions gradually pass off. Fractures of the cranial bones—especially of the parietal—are well known to be occasionally produced by the force of the pains alone; particularly in cases of contracted pelvis, where the promontory of the sacrum projects very much inwards. So also the bones of the extremities may have been broken in cases where manual interference or turning has been required; especially if there has existed any disproportion between the organic and the inorganic constituents of the osseous system, or perhaps if there has been a slight want of dexterity on the part of the operator. The fracture is usually *simple*, and commonly occurs about the middle of the bone. Whenever these or similar accidents have happened, the misfortune should on no account be concealed, but at once be explained to the parents; and steps must be promptly taken to secure the union of the fractured extremities by the application of bandages, and thin pasteboard splints well padded, so as to prevent irritation of the skin. Fortunately the broken bones readily unite at this period of life, the consolidation being usually perfect by the end of fifteen days. In fractures of the cranium unaccompanied by depression, union will take place without any special treatment.

An interesting case is recorded by Mr. J. D. Jones, of an infant born with a large wound upon its back, which deserves attention, if only for its important medico-legal bearings. The facts are briefly these:—In April, 1848, Mrs. B—— was delivered at the full term of utero-gestation of her first child, after an unusually easy labour. On examining the infant, an extensive open wound was found, reaching from the third dorsal vertebra, across the scapula, along the back part of the humerus, to within an inch of the elbow. That the cut could only have been made some time before birth was clear; for fully one-third of it was cicatrized, and the rest had the healthy granulating appearance of a wound healing kindly. How, then, was it produced? The only explanation offered was this: when the mother was about seven and a half months pregnant she trod upon a cat as she was going downstairs, and, to save herself from falling, made a jump of five or six steps. A severe shock was felt at the time, and on the following day there was a slight sanguineous discharge per vaginam: she however soon recovered. It is no doubt difficult to understand how such an accident as this could produce the injury which was discovered at birth, nor do we express any opinion that it was so.

Another case, very similar to the above, came under our notice, and is recorded in the seventh volume of the *Obstetrical Transactions*. The child in this instance was malformed, but born alive, though it died soon after. Two lacerations existed, one across the throat, having very much the appearance of some foul play, the other across the belly, exposing the liver and stomach. Both lacerations were quite through the skin, and the chief peculiarity was the remarkable facility with which the skin could be torn; it was also very thin as well as brittle, and contained little or no areolar or connective tissue, but only bundles of fat vesicles heaped together. Microscopically too the skin was found to be singularly deficient in the yellow elastic fibrous tissue, and the white or ordinary connective fibrous tissue. The opinion formed therefore was that there was an arrested development of the true skin and of the subcutaneous tissue.

After birth the healing progressed favourably in Mr. Jones' case, so that in five weeks there was only a large cicatrix left

Now, if in these two cases the mothers had been friendless unmarried women, and had been delivered without medical aid, who would have doubted that they had purposely injured their children in order to destroy them, and thus to rid themselves of the witness to their shame! The silent testimony of the fresh wound might in either case have led an unhappy mother to the scaffold, and few would have had the charity to give credence to any assertion of innocence.

III. CEPHALHÆMATOMA.

This term is employed to designate a sanguineous, non-pulsating tumour, which sometimes forms in the cellular tissue of the scalp, between the bones of the skull and the pericranium. A cephalhæmatomatous tumour varies in size from that of a hen's egg to a large orange, according to the quantity of blood extravasated; and it generally increases for the first few hours after birth. It may result from long-continued pressure upon the head during a difficult labour; or it may appear after an easy delivery, probably owing to some disease of the bone existing before birth. The tumour is generally formed on one or other of the parietal bones: on the right more frequently than on the left; but occasionally on both. We have seen cases in which the tumour existed on other parts; on the occiput for instance; and others where more than two tumours existed. Of 180 cases, 159 occurred on one or other parietal bone, 11 on both parietal, 2 on the occipital, 2 on the frontal, and 1 on the temporal. It occurs more frequently in boys than in girls. The swelling is soft, circumscribed, and sometimes, but by no means always, fluctuating; it generally pits on pressure; and its base often becomes encircled by a hard ring, caused probably by the occurrence of ossification in the exudation which is poured out by the irritated pericranium.

According to Rokitansky, if absorption does not take place, or if the fluid blood be not evacuated, suppuration is very apt to occur, followed by ulceration of the soft parts, and death of the bony tissue. This may extend even to both plates, when a fatal issue commonly takes place. Such an extension, however, is excessively rare.

Occasionally there is, in addition to the subcranial hæmorrhage, effusion of blood between the dura mater and the skull, and in these cases the prognosis is much more unfavourable.

Diagnosis.—In tumours about the head, it is necessary to remember that cerebral hernia sometimes occurs. It is differentiated from cephalhæmatoma by its being situated at a fontanelle, or in the track of a suture, and by the tumour pulsating.

Treatment.—In the cases which have come under our own observation, and we have seen a large number in hospital and private practice, we have generally left the treatment entirely to Nature, as recommended by most authorities; nor has there been any reason to regret doing so, as the effusion has usually become absorbed in a few days. In some instances, perhaps, the absorption may be hastened by the use of evaporating lotions, though this is exceedingly doubtful; the lotions may even have a contrary effect: but we should certainly hesitate to adopt any more active treatment, and especially that recommended by Naegele, Dubois, and others—viz., incising the tumour, removing the blood, and applying compression. At any rate this step should not be taken till other means have failed, or until it has been proved that the tumour has remained stationary for at least a fortnight. Should suppuration, however, take place, the pus must be evacuated, and the sooner this is done the better, for the case may otherwise develop into a dangerous abscess.

A kind of false cephalhæmatoma is sometimes produced by the effusion of blood into the cellular tissue between the aponeurosis of the scalp and the pericranium, but like the ecchymosis of a bruise, it requires no treatment.

IV. NÆVI MATERNI.

The term *nævus maternus*, or *mother-mark*, is applied to many different cutaneous spots with which children may be disfigured; but as moles or superficial pigmentary patches are not painful, do not increase in size after birth, and cannot be removed, the following remarks will be confined to the consideration of the vascular or erectile nævus, or as it is sometimes termed—aneurism by anastomosis.

The erectile nævus may be defined as consisting of morbid spongy tissue, formed by an agglomeration of dilated and distorted capillaries, inosculating directly and freely with each other. In some cases arteries or veins, or both together, are affected. It commences usually as a small red or purple spot; has a tendency to dilate and spread; and affects the skin and subcutaneous areolar tissue of any region, but especially of the face, head, and neck. As the growth proceeds, the nævus becomes elevated above the cutaneous surface, and sometimes forms a soft tumour, which may increase to a great size. The erectile nævus, as a rule, is single, but sometimes several are developed on the same individual. Pulsation is rarely to be distinguished except in cases where the nævus is near a large blood-vessel: occasionally a thrill is communicated to the fingers.

Treatment.—When the nævus is small, does not increase in size, and is so situated as not to cause disfigurement, it should be left alone: occasionally a spontaneous cure takes place. When seated on the face, and when manifesting a tendency to burst or spread, we must endeavour to obliterate it; and for this purpose many methods have been proposed.

Vaccination is perhaps the best means to employ in infants. The number of punctures to be formed will vary with the size of the nævus; when large, several must be made at its circumference, and a few on the surface, so as to produce a confluent vesicle. Very large nævi have been thus transformed into firm fibrous tissue. Supposing that the child has been previously vaccinated, or that the inoculation has failed to destroy the spongy membrane, compression may be tried: or adhesive inflammation may be excited by occasional frictions with iodine or antimonial ointment: or several threads may be passed through the tumour with a fine needle, and allowed to remain until they give rise to suppuration: or a drop or two of nitric acid, or of the acid nitrate of mercury, may be applied: or a finely pointed stick of potassa fusa may be gently rubbed over the surface of the tumour, to produce ulceration: or the galvanic cautery may be resorted to, the heated wire being passed through the mass in various directions: or a solution of the perchloride of iron may be injected into the erectile tissue to coagulate the blood in its vessels. In the latter case, to avoid the occurrence of emboli, it is necessary that a hard ring be made to firmly circumscribe the nævus to be obliterated, before injecting the iron solution.

The most certain mode, however, of obliterating a nævus is the application of a ligature, so as to encircle the diseased part, and produce strangulation and sloughing. A ligature may be employed in various ways: thus Sir William Fergusson has cured cases by passing one or more needles through the nævus, turning a thread round it or them, as in making the twisted suture, and allowing the whole to remain for forty-eight hours or longer. We have also seen this gentleman successfully obliterate the vessels by passing ligatures under the tumour, so as to strangulate the diseased mass without destroying the cutaneous surface. Or a needle carrying a double thread may be passed through the centre of the base of the tumour, and the ligatures tied round each hemispherical half. Lastly, a modification of the treatment by ligature has been recommended by Mr. Cooper Forster, which is thus practised:—Two pins are to be passed at right angles to each other under the mass, and a ligature tied tightly round the whole: the pins are to be withdrawn immediately, and four hours afterwards the ligature is to be untied; a scab forms, which drops off at the end of fourteen days or so, without any suppuration, open sore, or untoward result occurring. The rationale of the treatment appears to be that the vessels compressed by the ligature have the current of blood in them arrested for a time, but not sufficiently so to entirely obliterate them, or to cause the part encircled to slough at once. By this means entire destruction of the nævus is prevented, but sufficient obstruction is caused to allow the blood in the tissue to become consolidated; the whole then atrophies and drops off, leaving scarcely any scar.

Excision of vascular tumours is rarely resorted to; though from what we have seen of the operation we should say that it is far less serious than is commonly supposed. At the same time no doubt care is necessary to avoid severe hæmorrhage, and the incisions should always be made in the healthy tissues around the tumour.

Mr. Bulmanno Squire has successfully introduced the operation of scarification where the nævus has been of considerable extent.

V. SCLEREMA.

This peculiar disease—well termed by M. Roger *algide œdema*—consists of either partial or universal induration of the subcutaneous areolar tissue, with serous effusion. It is very rarely met with in this country, but appears to be by no means uncommon in France. The lower extremities are the most frequently affected, sometimes the upper, and occasionally the trunk, but very rarely the face. Males appear to be more liable to the disease than females, and it occurs much more frequently in winter than summer. Children who are ill bred and ill fed, and those prematurely born, are most subject to it.

In many respects sclerema bears a striking resemblance to ordinary anasarca; and it appears to depend upon some obstruction to the circulation of the blood. The nature of this obstruction cannot be positively stated; but it is probably caused by deficient expansion of portions of the lungs—atelectasis. It usually occurs within the first ten or twelve days after birth, and generally in feeble or premature children; its development is favoured by cold, damp, and impure air; it may be partial or general; is often accompanied by well-marked jaundice, and is frequently complicated by the occurrence of gastric and intestinal disturbances.

Symptoms.—The disease usually commences at the lower extremities, by the skin first assuming a dry, stiff, yellowish, waxy appearance; and gradually becoming distended and unyielding, so that the infant is said to be skin bound. As the disorder rapidly progresses in an upward direction, the temperature of the whole body becomes greatly reduced, but especially of the affected parts. This depression of the temperature is so remarkable that in some cases it has fallen as low as 72°, and an average temperature of only 78°·8 was the result of a large number of observations by M. Roger: the degree of depression appears to be in direct proportion to the extent of the disease, and in no case did recovery take place where the temperature fell below 88°. The infant looks prostrated and unhealthy, as if dying from exhaustion; there are indications of great restlessness and suffering, cries of a peculiar whining tone being frequently repeated: food is refused, and sucking prevented when the face is involved, deglutition appearing to be very difficult; the circulation is languid, and the pulse very feeble, sometimes not exceeding 60 per minute; the respiration is also difficult and laborious, in severe cases falling to about 16 in the minute.

The *Prognosis* is most unfavourable. Death usually supervenes—often from asphyxia—within the first week; but cases sometimes linger on for a longer time, though very rarely beyond the third week. Occasionally death is preceded by a tetanic condition, and sometimes by a state of trismus. When the disease is very limited in extent, and the respiration is only slightly affected, recovery may be hoped for: but general sclerema, on the contrary, may be said to be almost always fatal within a few days from the first appearance of the symptoms.

Morbid Anatomy.—The disease is entirely limited to the subcutaneous cellular tissue, which is thickened, indurated, and at the same time œdematous. The adipose tissue is very solid, from the presence of numerous fat granules, and the veins within it are gorged with black blood, as, indeed, are most of the organs and tissues. The most common visceral lesion is venous engorgement of the liver, and a subacute inflammation of the intestinal canal. The brain is also much congested; occasionally there is ventricular effusion. Sometimes the lungs are in a state of inflammation; they are generally hyperæmic. As a consequence of this venous turgescence in most of the tissues, there is a good deal of serous effusion, even in the larger cavities.

Treatment.—Therapeutic measures are generally unavailing. Attempts may be made to restore warmth to the body and to induce perspiration by frequently repeated vapour baths, long continued gentle frictions with warm flannel, and by enveloping the child thoroughly in cotton wool. The application of leeches over the œdematous parts, to lessen the quantity of blood in the system, and so favour its circulation, has been recommended; but we should rather trust to the frequent administration of wine or other cordials and stimulants in small quantities, and rigidly avoid all lowering measures. In some cases where there is great distress and difficulty of breathing, counter-irritation or stimulation to the chest seems to do good, and from the general character of the lesions found after death, this method of treatment appears to be specially applicable. The administration of alteratives in the form of calomel or grey powder may likewise be beneficial.

VI. UMBILICAL HÆMORRHAGE.

The detachment of the remains of the funis from the umbilicus of the newly born infant, is usually completed in five or six days; those cords dessicating the most rapidly which are small and thin, and not overloaded with gelatinous matter. When the separation is favourably completed, there is merely a slight oozing of serum; the navel becomes daily more drawn inwards until by the end of the second week, the cicatrix is found firmly healed, and marked at its centre by a small hard tubercle, consisting of the obliterated extremities of the arteries and vein.

It occasionally happens, however, that instead of cicatrization quickly following the detachment of the cord, the umbilicus becomes inflamed and ulcerated; suppuration takes place; and very serious hæmorrhage sometimes occurs, so as to endanger life. When there is only slight inflammation, or superficial ulceration, great attention to cleanliness, with the frequent application of Goulard water, or of the benzoated oxide of zinc ointment, may suffice to effect a cure; while, if the ulcer becomes indolent, it should be touched with sulphate of copper, or nitrate of silver. In aggravated cases with hæmorrhage, there is often reason for great alarm; the bleeding in such cases usually goes on slowly, until the child dies at the end of three or four days. .Sometimes, where there is merely a free oozing of blood, the bleeding may be permanently controlled by the application of cotton wool, soaked in a saturated solution of the perchloride of iron; but, unfortunately, this will not always, or even frequently, succeed; for pressure, styptics, nitrate of silver, the actual cautery, and even the ligature—applied by transfixing the base of the navel with a hare-lip needle, and then twisting a thread around and beneath it—have all been tried, and have proved useless. Two examples of this fatal occurrence in infants of the same mother are related by Dr. Bowditch. The first child was a female; the cord fell off on the third day, and there were no unusual appearances until the fourteenth, when oozing of blood commenced. Styptics, compression, and other means having been tried in vain, needles were passed through the skin, and ligatures applied —as in hare-lip, so as to enclose a circle of integument. This seemed at first quite successful; but on the eighteenth day the bleeding returned; on the nineteenth several bloody stools were passed; and on the twentieth death took place. After the mother had been delivered of two more children, neither of whom manifested any tendency to hæmorrhage, she gave birth to a male infant. The cord fell off naturally on the fifth day, and on the tenth hæmorrhage set in, which, in spite of all means—the actual cautery included—continued until death occurred, on the fourteenth day. In this case jaundice, together with some spots of ecchymosis, appeared on the body during life: after death the liver was found to be much diseased.

VII. HÆMATEMESIS AND MELÆNA.

The newly born infant sometimes suffers from vomiting and purging of blood; but so rare is this disorder in England, that in many of our treatises on the diseases of children no mention is made of it. It is essentially a disease of the early days of life, generally occurring between the first and sixth days: the greater proportion of recorded cases occurring in males.

The alleged *cause* is compression of the body during a tedious labour; but this is insufficient, as it has happened almost as frequently after natural, as after protracted labours. M. Rilliet has shown that the true predisposing causes should be sought for—1st. In the injection of the intestinal tube, a state which is normal at the birth: and 2nd. In the difficulty with which respiration becomes established; the blood not being able to flow to the lungs, their expansion takes place imperfectly, and the other organs, but especially the intestines, which—already congested—are unable to support this new tax, become greatly engorged, and hæmorrhage results.

Symptoms.—The precursory symptoms are best described by Dr. Rahn Escher, whose remarks may be abridged as follows:—An infant, on the day of its birth, slept almost continuously; he changed colour frequently; had partial convulsions; deglutition was difficult; and he vomited: the following day hæmorrhage set in. Another infant was seized, four days after birth, with yellow watery stools, convulsions, paleness of countenance, spasmodic respiration, tympanitis, and great prostration: in the evening of the same day the bleeding showed itself. When hæmorrhage once sets in, it is generally abundant: the stools, first composed of meconium and blood, soon consist of the latter only; and usually there is also vomiting of blood. Sometimes the vomiting of blood is more abundant than the intestinal hæmorrhage: occasionally the former exists alone. Etlinger gives the history of a little patient who passed more than a pound of blood in the vomits and stools.

The hæmorrhage in these cases usually attains its maximum some time within the first twenty-four hours of life, and ceases upon the second day; but it may continue up to the fifth day, and even later. The loss of blood rapidly prostrates the system; the infant becomes deadly pale, cold, and very feeble; the pulse is small; the breathing difficult; occasionally there are convulsions; and usually an inability to suck. The subjects of the cases collected by Dr. Rahn-Escher remained thin, pale, flabby, weak, affected with diarrhœa or constipation, and subject to convulsions. One had afterwards symptoms of rachitis; another sank from tabes mesenterica and hydrocephalus at the age of twelve months; and a third, when one year old, was still very feeble and deadly pale.

Prognosis.—In twenty-three cases, in which the termination is mentioned, the issue was satisfactory in twelve and fatal in eleven: in nine of the latter death was rapid. According to Hesse, the hæmorrhage is to be regarded as the salutary crisis of a plethoric condition, the melæna of infants not being more dangerous than the simple melæna of adults. Rilliet disagrees with this statement, and the statistics just alluded to prove the justice of his objections; for when simple hæmatemesis occurs in the adult—*i.e.*, when it is not merely a symptom of cancer in the stomach, of organic disease of the liver, or of a deterioration of the blood from some acute fever—there is almost always a restoration to health, however abundant the bleeding may have been.

Diagnosis.—This is only difficult when the blood is retained: even then the sudden paleness, the great feebleness, and the small pulse, point to internal hæmorrhage. Care must be taken not to mistake this affection for blood drawn from the mammæ of the mother, or from excoriations on the nipple, and swallowed by the infant. So also it must not be confounded with spontaneous bleeding from the nasal fossæ.

Treatment.—Drs. Rahn-Escher and Rilliet administered diluted sulphuric acid in cinnamon-water in some cases; and in others, an emulsion containing alum and musk, with fomentations of quinine and vinegar: cold compresses to the abdomen, and astringent enemata have also been used. They have, however, but little faith in any internal remedies; and advise that we should be content to place the infant in a cool and frequently changed atmosphere, to apply cold compresses to the abdomen, and to keep the extremities comfortably warm. Probably the glycerinum acidi gallici of the British Pharmacopœia with the infusum rosæ acidum would have a beneficial effect in these cases, as we have found it very successful in arresting other forms of hæmorrhage; the same remark applies to the use of the liquor ferri peracetatis, which is a most valuable astringent, and has the further merit of its chalybeate action. If the pulse be very feeble, a teaspoonful of wine with water may be given, or a few drops of ammonia and ether in camphor mixture. In all instances the child should be placed to the breasts if it have strength enough to suck; otherwise it must be fed with the mother's milk drawn into a spoon

VIII. INTUMESCENCE OF THE MAMMÆ.

A painful swelling of the breasts sometimes takes place in infants of either sex a day or two after birth; but the tumefaction, unless improperly interfered with, generally disappears spontaneously without giving rise to any trouble. As a drop or two of viscid fluid may sometimes be squeezed from the gland, ignorant nurses and mothers often imagine that this swelling depends upon the natural secretion; and rude manipulations are consequently employed to force out "the stagnant milk." It is almost unnecessary to say that the swelling should not be touched; for friction or pressure will only tend to convert a simple congestion into inflammation, which may be followed by suppuration and abscess.

The *Treatment* best adapted to these cases is, the application of soothing and emollient poultices, such as linseed meal with a little laudanum added; this generally suffices to effect a cure. In some cases warm sedative fomentations, such as decoction of poppy heads, appear to answer best; and in some others cold evaporating lotions, such as eau de Cologné and water, spirit of wine, or gin and water, have proved equally serviceable.

CHAPTER II.

MALFORMATIONS AND DEFORMITIES.

It will be convenient both for practice and study if we group together the various malformations and deformities to which children are subject into two great divisions—viz., the congenital, and the non-congenital or acquired. It must be remembered, however, that there is no arbitrary rule in regard to this classification, for those which most frequently belong to the former class may occasionally be acquired after birth; still the division is convenient and useful. We will, therefore, first consider the congenital class.

I. CONGENITAL MALFORMATIONS.

1. Introductory Remarks. — The immortal Harvey first suggested that certain congenital malformations consist, not in the substitution of an entirely new and anomalous type of structure in the malformed part, but only in the simple permanence of some of its transitory fœtal types; and the labours of Geoffroy St. Hilaire, Meckel, and others have reduced this suggestion into one of the most certain and comprehensive laws in teratological anatomy. As the transient forms of the human fœtus are for the most part comparable to the persistent forms of the lower animals, it follows that the malformations occasioned by impeded development often acquire a brute appearance; and thus is explained the fact that they exhibit in different animals the form of the lower, but not of the higher, classes.

It likewise appears probable that a limited series of the malformations that are now generally looked upon as decided results of arrested development, may come again to be regarded as cases in which the defective part had been, in the first instance, more or less fully evolved, and then subsequently destroyed by morbid action. Thus many eminent pathologists now attribute some of the most marked malformations of the head and upper part of the body to the destructive effects of hydrocephalus in the embryo. At a meeting of the Obstetrical Society of Edinburgh, 15th June, 1847, Sir James Simpson stated, that in anencephalous monsters, he believed the malformation arose from intra-uterine disease—viz., from the bursting of the head when hydrocephalic. The brain is opened up and distended by fluid, so that it becomes gradually absorbed, and at length the enclosing membranes give way. The two small tubercles, always seen in anencephalous cases, lying on the base of the cranium, seem to be merely the remains of the membranes, shrunken up, and almost obliterated.

With regard to the origin of double monsters, no satisfactory explanation can be given. The three principal hypotheses which have been suggested, are—*a*. that of originally double ova; *b*. that of an excess or wrong distribution of formative power in a single ovum; and *c*. that of the adhesion and fusion of two single ova. Objections may, however, be raised to each of these opinions; and it is probable that none of them is correct.

In the production of malformations, Nature seems to do nothing by chance, but rather to observe certain general, though not universal, laws, the chief of which are:—1. Deviations from the normal do not proceed *ad infinitum*, but are confined within certain limits: thus, although organs which should lie on the right may appear on the left, and the converse—though the abdominal viscera may occupy the thorax, and the thoracic the abdomen—yet the brain has never been found in the chest, nor the kidneys in the skull. 2. Excessive development of one part may cause imperfect or retarded development of another, according to what Geoffroy St. Hilaire denominates *loi de balancement*. Thus fingers and toes in excessive number are often joined to *anencephalia*, *cyclopia*, &c. 3. Malformations, according to Meckel, are more rare in organs supplied by cerebro-spinal nerves (muscles, larynx, lungs), than in those supplied by the sympathetic (the digestive, urinary, and generative). The vascular system is, however, most liable of all. 4. In malformed births, dissimilar parts are never seen fused or united with each other, such as the intestinal tube with the aorta, the arteries with the nerves, &c. 5. No malformed organ loses entirely its own character, and no malformed animal loses its generic distinction. 6. Female malformations are by all accounts more frequent than male. 7. Meckel has collected many examples of the hereditary nature of malformations, and their repetition in children of the same parents. Thus, a man with six fingers to each hand, and six toes to each foot, transmitted the same malformation to his eldest son; whose three sons, again, were born with the same redundant organization. 8. The malformations seldom, or perhaps, never, agree with the apprehensions *à priori* of pregnant women. In the case of twins, as the acephali especially show, one child may be malformed and the other perfect, though both have been exposed to the same influences. 9. It often happens that a woman who has once produced a malformation is troubled by the fear of another similar occurrence; but her fears are usually groundless, for the second child will generally be well formed. There are exceptions to this rule in the production of merely supernumerary parts, and also in twin malformations, which often recur out of the same mother, from some hereditary tendency. 10. In twin malformations the same parts always coalesce—as thorax with thorax, abdomen with abdomen, head with head.

A complete account of all the various malformations of the fœtus would be out of place in these pages. We shall, therefore, with a few exceptions, confine our descriptions to those forms which are not necessarily fatal to life, and which, perhaps, admit of some relief or cure.

2. ACEPHALUS.—The head alone may be wanting, or with it more or less of the trunk, so that nothing may be present save a pelvis with lower extremities. In these cases the pregnancy is almost always a twin or triple one, the malformation being only fatal to the affected fœtus. Rokitansky observes, that, in some instances, perhaps, this state is deducible from injury to, or destruction of, the germ, or from the disturbance occasioned by a twin.

3. ACRANIA.—The skull is present but fissured. Uterine life does not seem to be interfered with, as the children are born well nourished; they rarely, however, survive their birth many hours. There are many forms of this monstrosity: thus, the brain may be absent and the whole base of the skull exposed; or, the denuded surface of the base of the cranium may be occupied by a spongy substance instead of brain; or, the skull may be more developed, but an opening exists through which the brain protrudes as a hernia. In this last variety—*hernia cerebri, encephalocele*— a tumour, generally covered with the external integuments, arises from some part of the skull, and contains a portion of the cerebrum or cerebellum, or even the entire cerebellum. In some instances there is a collection of serous fluid in addition to a portion of brain, forming what is termed a *hydro-encephalocele.* The tumour is most frequently observed on the occiput, forehead, anterior or posterior fontanelle, lambdoidal suture, or on either temporal region. Encephalocele is not necessarily fatal; as, although most children afflicted with it die during early infancy, yet cases are recorded where life has lasted twenty, thirty, or even sixty years. As a general rule, all treatment is useless; but there are some exceptional cases, where the tumour may be replaced in the skull without detriment to the child, and may be retained in position by a thin metallic plate and bandage. Should the collection of serum also be large, a minute puncture may be made with a needle to allow of its escape; methodical and regular compression being afterwards employed to try and prevent its re-secretion. Some practitioners have endeavoured to remove the tumour by ligature, but the operation has always been fatal.

4. ATRESIA PALPEBRARUM.—The eyelids are said to coalesce naturally towards the end of the third, or the commencement of the fourth, month, and to separate afterwards. Accordingly, this malformation would be an arrest of development. The adhesions must be divided on a director cautiously introduced at the outer angle of the eye. This formation, however, is seldom simple.

5. ATRESIA ORIS.—According to Burdach, the lips coalesce in the fourth month, closing the mouth until the sixth, when they

again separate. According to Bischoff, however, this malformation might have a different origin. At a very early period of intrauterine life, the visceral edges of the animal layer mutually incline towards each other inferiorly; they subsequently unite, and form through the medium of Rathke's so-called inferior bond-membrane, the visceral cavity of the embryo. Not until the visceral arches break forth above does the upper portal to the nutritive canal open, and the mouth does not open until still later. The atresia might, therefore, depend upon the continuance of the bond-membrane. In either case it would be an arrest of development. (Rokitansky.)

This malformation is rare, and when it exists is usually associated with other malformations. A small opening should be made with a bistoury at either corner of the mouth, so as to allow of the introduction of a director, upon which the closed membrane is to be divided. Care must be afterwards taken to prevent the cut surfaces from re-uniting.

6. **Atresia Linguæ.**—The tongue may be unnaturally adherent to the sides, or to the under surface, of the mouth, so that sucking and other movements are prevented. The adhesions must be cautiously divided with a bistoury, and the bleeding checked by the application of lint soaked in a solution of alum or in the tincture of the perchloride of iron.

The frænum linguæ is sometimes so short that its attachment reaches nearly to the tip of the tongue; this condition is thought by many, and universally so by nurses, to interfere with the motions of the organ, in which case the child is said to be *tongue-tied*. The malformation is by no means uncommon; and nurses and young mothers are very apt to imagine, especially if the child has the slightest difficulty in sucking, that this is the real and only cause of the difficulty. Be this as it may, the condition is one which is easily remedied by raising the tongue from the floor of the mouth with the two forefingers of the left hand, and then dividing the edge of the frænum for about the eighth of an inch with a pair of blunt-pointed scissors, held in the right hand. Care must be taken to cut as near the floor of the mouth as possible, so as to avoid wounding the ranine arteries or veins, as an accident of this kind is exceedingly untoward, and may even lead to a fatal issue unless the hæmorrhage is arrested. The proper treatment under these circumstances is to tie the cut vessel if the bleeding is distinctly arterial, if not, then probably the application of some astringent, alum, matico, or the perchloride of iron, will soon effect the purpose.

We are strongly of opinion, however, that operative interference for the relief of the condition often described as tongue-tie is very seldom required, and certainly ought not to be resorted to as often as nurses and mothers would have us believe. The practitioner ought, therefore, fully to satisfy himself that a real hindrance exists before he sets himself to remedy it.

7. **Hare-lip.**—The simplest degree of this deformity is what is

called *single hare-lip*, in which the lip is fissured only on one side; it may, however, be complicated with partial or complete fissure of the palate. The greatest malformation of the kind is that known as *double hare-lip with fissured palate.*

This arrest of development occurs only in the upper lip; the fissure is never in the mesial line, but always under one or both nostrils; and the deformity may vary from a slight notch to a complete fissure extending close into the nostril, so that an immediate communication is formed between the oral and nasal cavity. "With the imperfect development of the skin there is usually more or less of the same condition in the bone. That part of each superior maxillary bone which contains the incisor teeth, and which constitutes a distinct bone in the human embryo, and in many animals —the intermaxillary, or premaxillary of Owen—the divided hæmal spine of the nasal vertebra—may be disconnected on one or both sides, leaving a gap in the alveolus, which may possibly extend backwards to be complicated with fissure of the palate. This intermediate portion may be displaced and attached like a snout to the end of the septum narium. Sometimes the upper incisor teeth and their alveoli project through the fissure in the lip." (Druitt.)

Treatment.—The only point requiring consideration in these pages is as to the time at which attempts should be made to remedy the defect by operation. On this subject we need only say, that having seen this operation most successfully performed on infants only a few days old, remembering too that operations on infants do not produce convulsions—as was formerly feared, that the proceeding is not dangerous to life, and that the earlier it is executed the greater chance there is of the nose and jaw assuming a good shape, we do not hesitate to recommend its being early resorted to in all cases, but especially where the deformity produces any difficulty in sucking. Most authorities, both in this country and abroad, are in favour of early interference. Dubois and Guersent recommend that the operation be performed immediately after birth, and all seem agreed in advising that unless it is performed within the first few days or weeks, it is better to postpone it till the commencement of dentition, or until the time of weaning, if the parents so wish it. For the mode of performing the operation our readers should consult the admirable manuals on surgery by Sir William Fergusson, Dr. Druitt, and others.

8. CLEFT PALATE.—Although the deformity of hare-lip is often accompanied with fissure in the roof of the mouth, yet the latter may exist alone. When it does so, the alveolar margin is usually found quite complete; the fissure being confined to the hard and soft palate, or to a portion of them, or only to the uvula. Very rarely the cleft extends through the soft and hard palate and alveolar margin, leaving the lip entire.

The exact condition of the parts in this arrest of development had never been represented by any authority in this country until

Sir William Fergusson made his careful dissections. For an account of these, as well as for the manner in which the operation of staphyloraphy is to be performed, the reader is referred to this gentleman's writings. We may add, however, that so successful has the operation proved in his hands, that about 90 per cent. of the cases have done well. As a general rule, it should be borne in mind that no operation is to be attempted until the mouth is fairly well developed, that is to say, at or about the period of puberty.

9. AMYELIA.—Absence of the spinal cord is described under this term. It is very uncommon, and is almost always combined with *acrania*. Death takes place directly the fœtus is separated from its parent. The medulla spinalis may be present, but fissured into two juxtaposed cords; or it may be absent, and its place be occupied by a simple nervous expansion. In both cases death occurs soon after birth.

10. SPINA BIFIDA AND HYDRO-RACHIS.—Fissure of the spinal column, and dropsy of the spinal medulla, are usually connected together, though either may occur separately. When spina bifida is unaccompanied by hydro-rachis, the deformity consists in absence of the spinous processes of the vertebræ; the vertebral arches being bent towards each other so as to leave only a very slight space between them. In the greater number of cases, however, the spinous processes and laminæ of some of the vertebræ are widely cleft, or deficient: consequently the cord and its coverings being deprived of support, protrude and form a tense, elastic, fluctuating tumour, varying in size from an orange to an adult head: the serous fluid which naturally lubricates the medulla and its membranes being secreted in excess. The size of the opening varies greatly; it may involve only one or several vertebræ, and may be situate in either the cervical, dorsal, lumbar, or sacral regions. Sometimes the cleft occurs in two or three different places, forming separate tumours; and cases are recorded in which nearly the whole has been thus bifid.

The cyst generally contains a limpid colourless fluid, which may sometimes be returned into the spinal canal, so that the cyst itself collapses: it varies also with the position of the child. Sometimes pressure upon it cannot be tolerated, and the child is thrown into convulsions or coma.

The tumour is generally covered with skin, under which is areolar tissue, then dura mater, and lastly, arachnoid. If the child lives, the latter becomes thicker and harder as age advances: occasionally the surface of the tumour ulcerates, and sometimes it takes on a sloughing or gangrenous condition. "The connexion which generally exists between the cord or the nerves and the walls of the sac is a point of the utmost importance. Some cases are related, by various authors, in which neither the cord nor the nerves had any connexion with the sac; these parts followed their usual course down the spinal canal, but in by far the greater number of cases that have been placed upon record, the nerves presented some kind of connection with the sac. Of *twenty* preparations of spina bifida occupying the lumbo-sacral region, which I have examined in various collections, I have found but *one* in which the nerves were not connected with the sac. If the tumour corresponds to the two or three upper lumbar vertebræ only, the cord itself rarely deviates from its course, and the posterior spinal nerves are generally the only branches which have any connexion with the sac. But if the tumour occupies partly the lumbar, and partly the sacral, region, then generally the cord itself and its nerves will be found intimately connected with the sac. M Cruveilhier believes, from his dissections, that this connexion is constant." (Prescott Hewett.)

The *Symptoms* which usually accompany this condition vary with the amount and position of the spinal deformity; with the existence or not of hydrocephalus; and with the connexion between the contents of the cyst and the spinal cord. Generally, however, there is more or less of paralysis of the parts supplied by the nerves below the seat of lesion, of the lower limbs, and the sphincters. Convulsions and other symptoms arise when the cyst is inflamed, or when it is pressed upon or otherwise injured. Other symptoms occur when, as sometimes happens, the cyst bursts. In all these cases the leading symptoms are due to inflammation of the spinal cord and its membranes. Occasionally this is so severe that suppuration results, and the cyst is converted into an abscess.

Terminations.—Before birth, spina bifida does not seem to affect the fœtal health; afterwards, the effects vary with the seat of the tumour, and its contents. When the cleft is in the cervical portion of the spinal cord, it is generally fatal a few days after birth: it is the least dangerous when seated in the lumbar and sacral regions, some few individuals having lived with it for twenty or thirty years, or even for the natural term of life. If complicated with hydrocephalus, the prognosis is very unfavourable; and such is also the case when there is paralysis of the lower extremities, or when the tumour continues to enlarge, or when its walls enlarge and burst. This malformation is said by Chaussier—whose opportunities for observation at the Paris Maternité have been large—to be met with about once in every thousand births.

Treatment.—As a general rule, the less the tumour is interfered with the better; all operations being attended with great danger. And in cases where the opening and the tumour are both small, and where the latter has a tolerably firm covering, it certainly ought not to be touched. In cases, however, where the fluid contents are rapidly increasing in amount, it is certainly justifiable to try the effects of puncture, followed by compression. There are two rules laid down by Mr. Prescott Hewett which ought to be observed:—1. The tumour should never be punctured along the mesial line, especially when it is situate in the sacral region, for it is generally at this point that the cord and its nerves are connected with the sac.

The puncture is to be made at one side of the sac, and at its lowest part, so as to diminish the risk of wounding any of the nervous branches. 2. The instrument used should be either a needle or a very small trocar: if a lancet is used there will be a much greater risk of wounding some important part contained in the cavity of the tumour. Compression by air-pads and bandages should be resorted to after evacuating the fluid of the sac. In the few cases which have come under our observation, we have tried both the do-nothing system and the treatment by tapping. The results have been equally unsuccessful, certainly no good seemed to have followed the evacuation of the cyst, for it speedily refilled, and death gradually resulted, apparently from exhaustion.

Another method which has been recommended and practised for the radical cure of this defect is the application, by means of two quills or wooden rods, of lateral compression, on either side of the tumour; this plan is said to have been very successful, and not to have produced any evil results. M. Mouchet advises puncturing and the use of the elastic ligature.

Iodine injections have been proposed and practised, and in some cases with apparent success. More evidence, however, is required of the safety and utility of this mode of treatment before its adoption can be recommended.

In all instances attention should be paid to the general health: the diet should be nutritious, and, in the case of an infant at the breast, great care should be taken that the nurse is strong and healthy: while if residence at the seaside can be obtained so much the better.

11. Ectopia Cordis.—In the regular evolution of the fœtus, the opening on the anterior surface of the body closes at its upper part in order to cover the thoracic viscera, before completing the abdominal cavity; so that the thoracic viscera are enclosed, while the abdominal still remain out of their cavity and in the sheath of the umbilical cord. Unfortunately, however, it sometimes happens that the abdominal wall is completed whilst the thorax remains open, and the heart is placed on the anterior surface of the latter. In this malformation—ectopia cordis as it is called—the heart has no pericardium, and is situated on the median line of the anterior wall of the thorax; the sternum also is generally wanting, or it is divided into two parts, or it consists only of the manubrium.

During fœtal life this condition is immaterial; but very shortly after birth it causes death. Cruveilhier had the opportunity of studying the motions and sounds of the heart in a child who was alive nine hours after birth: the heart was outside the chest, having escaped through a perforation in the superior part of the sternum, so that it was as completely laid bare as though the sternum had been removed and the pericardium incised.

12. Permanent Patency of the Foramen Ovale, &c.—The septa of the ventricles and auricles form only gradually within

the heart, the septum of the auricles not arriving at its full development till after birth. Defective development of the septum of the ventricles occasions a resemblance to the hearts of fishes and of reptiles (the crocodile excepted), and especially of serpents and tortoises; absence of the septum of the auricles, a resemblance in particular with the hearts of fishes. It is often quite evident that the arrest of development has been caused by endocarditic changes in the valves—the residue of fœtal valvular inflammation.

The date at which the foramen ovale and ductus arteriosus cease to be patent is not accurately known; but it is certain that these openings are not obliterated immediately after birth, and that the period at which they become so varies in different cases. From numerous post-mortem examinations made by M. Billard, this gentleman concludes that both openings are usually closed in from eight to ten days; although he has found them open at the end of three weeks without giving rise to any peculiar symptoms. Moreover, the same author observes, that the modifications which take place in the organs of circulation of the new-born infant occur in the following order: the umbilical arteries are obstructed; then the umbilical veins; the ductus arteriosus; and lastly, the foramen ovale becomes cold.

13. CYANOSIS.— It is thought by some authorities that, if the fœtal openings remain patulous much beyond the above periods, or if any abnormal communication exists between the cavities of the heart, a mixture of the arterial with the venous blood results, and that this gives rise to the peculiar affection termed cyanosis. But, on the other hand, cases are recorded in which a very large opening has existed between the two auricles, yet without any symptom whatever of cyanosis. Moreover, a patent condition of the foramen ovale, which is the normal condition of fœtal life, is unaccompanied by cyanosis; and conversely, cyanosis has existed in the fœtus when the foramen ovale has been found closed. It seems clear, therefore, that though the two conditions may be not unfrequently associated, yet they cannot be regarded as cause and effect, at least not in all, if in any cases. No less an authority than Louis declined altogether the supposed explanation, and he even denied that any admixture of the two fluids took place, however wide the opening between the two auricles, provided that the other orifices were free, and the auricles of equal strength.

It rarely happens that a patency of the foramen ovale exists alone, and without other structural lesions. In cases of cyanosis, sometimes there is communication also between the ventricles, sometimes an abnormal opening exists between the ventricle and aorta, sometimes the aorta springs from both ventricles, and sometimes the pulmonary artery is o structed. There is frequently dilatation and hypertrophy of the right side of the heart, and valvular abnormalities are not uncommon.

A consideration of all the circumstances connected with the disease under notice, the symptoms, progress, termination, post-mortem appearances and results, leads indubitably to the conviction that, in whatever way it is brought about, obstruction to the course of the blood through the pulmonary artery is the essential feature in the case. This soon leads to dilatation of the right ventricle and auricle, and to their subsequent hypertrophy from the effort to overcome the obstruction. Still acting backwards upon the nervous system, congestion and general turgescence of the venous circulation ensues; while the obstructed pulmonary vessels necessarily entail an imperfectly aërated state of the blood generally, and hence the blue discoloration of the surface of the body. All this may occur without there being any admixture of the arterial and venous blood, and with a perfect septum between the two sides of the heart.

Cyanosis, or Morbus Cœruleus, or Blue Disease, is characterized by a blue, purple, or leaden hue of the integuments, which is most marked in the lips, cheeks, and nails; there is generally coldness of the surface; prominence of the eyes; considerable feebleness; and occasionally paroxysms of difficult respiration, which are especially induced by any excitement or other cause which hurries the circulation. This affection is generally developed within the first month after birth, most commonly during the first few days; and it usually proves fatal at an early period, though cases are known in which patients have lived even to old age. The following table shows the relative frequency of death at different ages:—

27	cases	ended	fatally	within	1			month.
14	„	„	„	„	6			months.
12	„	„	„	from	6	to	12	months
16	„	„	„	„	1	„	3	years.
11	„	„	„	„	3	„	6	„
11	„	„	„	„	6	„	8	„
13	„	„	„	„	8	„	11	„
12	„	„	„	„	13	„	16	„
8	„	„	„	„	16	„	20	„
10	„	„	„	„	20	„	25	„
6	„	„	„	„	25	„	30	„
5	„	„	„	„	30	„	35	„
5	„	„	„	„	35	„	45	„
4	„	„	„	„	45	„	60	„
1	„	„	„	at	80			„
Total 155								

The most common and least fatal form of cyanosis is that in which a communication exists between the auricles by means of the foramen ovale. Occasionally—though very rarely—this variety undergoes a spontaneous cure owing, as is thought, to the obliteration of the opening. The chances of life depend very much upon the nature of the organic disease, and upon the severity and frequency of the paroxysms of dyspnœa; the period of greatest danger is, however, past when the child has reached its eighth or tenth year.

In regard to *Treatment* little can be done, at least in the way of cure; but much may be done to palliate the symptoms by allowing the patient pure air, a nourishing and easily digested diet, warm clothing, &c. Extra care will be required at the period of weaning, and during dentition. Rest and quiet are at all times of the greatest importance, both mentally and physically, for nothing should be allowed to hurry the circulation or to create distress and difficulty in respiration. The bowels should be carefully regulated, as this not only affects the circulation but it sympathetically interferes with the heart's action.

14. CONGENITAL UMBILICAL HERNIA.—The abdominal fissure may remain open through its whole extent, and the abdominal viscera will then lie out of the body. But the fissure may unite properly, except at the epigastric region; and congenital umbilical hernia then results. The size of the hernia will depend upon the viscera contained in it; the liver, stomach, and small intestines having all been found in tumours of large size. In one case which came under our observation there was complete protrusion of the entire liver; the child lived for several weeks, and died gradually of exhaustion, the result of a continuous and offensive discharge from an abscess which formed in the temporo-maxillary region. The surface of the tumour in this case assumed a sloughing condition which, however, did not extend any depth, and during the lifetime of the child no apparent evil results ensued from the tumour in question. The case, which is a remarkable and interesting one in many respects, is recorded in the second volume of the *Obstetrical Transactions*. These cases are not very common; four only are known in which the life of the malformed child lasted for any time after birth: in all of these, the external coat of the hernial sac mortified, and the tumour became gradually covered by true skin.

This malformation must not be confounded with the hernia which is produced after birth by the umbilical cicatrix expanding, so as to form a cylindrical or conical tumour, into which a portion of the omentum or intestine protrudes.

15. ABIDING PATENCY OF THE PROCESSUS VAGINALIS PERITONÆI (the upper portion of the tunica vaginalis testis) gives rise to congenital hernia, or hydrocele. Generally speaking, the inguinal canal closes immediately after the testis has—in the sixth or seventh month—descended from the abdomen into the scrotum, carrying with it a process or continuation of the peritoneum, which ultimately forms the tunica vaginalis. Occasionally, however, an arrest of development prevents the closure from taking place; and the canal, thus remaining pervious, allows a portion of intestine to descend, constituting *congenital hernia*; or an effusion of serum passes from the abdominal cavity into the scrotum, producing *congenital hydrocele.*

Treatment.—In congenital hernia, where we are sure that the testicle has descended into the scrotum, the intestine is to be returned—as soon as possible after birth—and retained in the abdomen by a small spring truss, the pressure of which generally causes slight inflammatory action and closes the opening. Before applying the truss, however, one precaution is necessary—viz., it must be quite clear that the hernia is reduced; for it sometimes happens that this cannot be accomplished, owing to the gut having contracted adhesions —probably from intra-uterine adhesive inflammation—with the testicle or some part of the tunica vaginalis. In those cases where the testis is still retained in the abdomen, the hernia should not be interfered with, provided it continues to come down after being replaced, as it almost certainly will.

In congenital hydrocele, the best treatment consists in endeavouring to give tone to the parts by gently douching them with cold water twice a day; while a small truss is worn to compress the inguinal opening. Should the tumour attain a considerable size, tapping with a very fine trocar may be resorted to; though such a proceeding will very rarely be necessary.

16. HYPOSPADIAS, OR CLEFT URETHRA AND SCROTUM.—This malformation may occur in various degrees. At an early period of fœtal life there exists, at the lower side of the rudiment of the penis, a groove, which extends to the common orifice of the urinary and sexual organs. In the male, the edges of this groove are brought into apposition, and coalesce into a raphé or suture; thus forming at once the scrotum and urethra. Where this process either wholly or partially fails, there arises a malformation, which, if the penis be at the same time short and the testicles are retained within the abdomen, closely simulates female development—a form of spurious hermaphroditism. It is incurable, and usually—but not necessarily, causes impotence. Sir James Simpson states, in his *Obstetric Memoirs*, that he has been consulted in three cases where hypospadiac male children have been baptized as girls. He refers also to an instance "where a child taken into a convent at Malta, as a female, turned out at puberty to be an amorous hypospadiac male; and subsequently became a sailor instead of a nun."

17. CLOACAL FORMATION consists of a junction of the anal orifice with the external orifice of the urinary and sexual organs; it is a formation which, being at an early period normal, may, through an arrest of development, become persistent. In the male it is necessarily associated with the last-mentioned malformation, that is, with hypospadias; and frequently also with cryptorchism (non-descent of testicles into scrotum).

There are two other varieties of hypospadias, more common, but less important than the preceding—viz., where the urethra, instead of being continued to the extremity of the glans penis, terminates at the base of the frænum of the prepuce; or where it opens just in front of the scrotum. In *epispadias*, the orifice of the canal of the urethra is on the upper surface of the penis, at a greater or less distance from the end of the glans. Occasionally, though very rarely, the parts are well formed, but the orifice of the urethra or of the prepuce will be found imperforate. In the first case, an orifice must be made at the proper site, and this should be prevented from closing by the occasional use of a bougie; while in the second instance, circumcision should be performed at once in the usual way.

18. HERMAPHRODITISM.—Hermaphroditic malformations may be arranged in two classes, the *spurious*,* and the *true:* the former comprehends such deformities as cause the genital organs of one sex to approximate in appearance and form to those of the opposite sex; the latter including those in which there is a combination, upon the same individual, of fewer or more of both the male and female organs.

Spurious hermaphroditism in the female, may depend upon excessive development of the clitoris, this organ occasionally being so large as to resemble the penis; and—however strange it may appear—it may also be suggested by prolapsus of the uterus and vagina. In the male, extroversion of the urinary bladder, adhesion of the under surface of the penis to the scrotum, and hypospadias, as before mentioned, may cause an appearance simulating female development.

True hermaphroditism comprehends the following varieties of malformation:—there may be a testicle on one side of the body, and an ovary on the other; instances of which have been observed in many animals and in the human subject—a good preparation taken from the body of a supposed male convict, is in the Museum of the Dublin College of Surgeons: or the external sexual organs may be male and the internal female, or *vice versâ*, as has been often observed among our domestic quadrupeds, and very rarely in the human subject. John Hunter showed (*Transactions, Royal Society*, vol. lxix.) that when the cow—especially among black cattle—brings forth twin calves, one a male, the other apparently a female, the male is a perfect bull calf, while the female is usually imperfectly formed in its internal sexual organs, though it has the external signs of a cow calf. Some hermaphroditic twin cattle are known as *free martins*. Or there may be a female uterus and male vesiculæ seminales, with a general female type: or an imperfect uterus may exist, occasionally provided with Fallopian tubes, superadded to a sexual organization essentially male—instances of which, occurring in the human subject, have been described by Harvey, Petit, Mayer, &c.: and lastly, there are cases in which both ovaries and testicles have co-existed upon one or both sides of the body—several examples of which are recorded as occurring among animals, while four are said to have been observed in the human subject. The student who wishes to learn all that is known on the subject here treated of, should consult Sir James Simpson's excellent essay on *Hermaphroditism* in the *Cyclopædia of Anatomy and Physiology*, vol. ii.

p. 684; or the reprint of the article in the same author's *Obstetric Memoirs and Contributions*, vol. ii. p. 214. Edinburgh, 1856.

19 EXTROVERSION OF THE BLADDER.—In this malformation—sometimes called congenital fissure of the bladder—there is a deficiency in the anterior part of the bladder, with fissure of the lower part of the abdominal walls; so that the inner surface of the posterior part of the bladder becomes extroverted, and lies exposed on the hypogastric region. The bladder thus forms a red, spongy tumour, just above the separated pubic bones; apparently involving the umbilicus, so as to give the appearance of a deficiency of the umbilical cicatrix. In male children the orifices of the vasa deferentia are to be found in the inferior part of the tumour. The orifices of the ureter are seen as small papillary eminences on the naked internal surface of the bladder; the urine drops continually out of them. In the male, the penis is fissured on its upper surface—epispadias; the testes are often retained in the abdomen or inguinal canal; and the vesiculæ seminales, prostate, and vasa deferentia, offer various deviations. In the female, the labia majora and minora are separated, and are without a commissure at their upper part; the vagina also is often closed or very narrow. This malformation is not dangerous to life, and the annoyance from the continual dropping of the urine may be remedied by wearing an apparatus for its reception. In some cases, too, a plastic operation may perchance be successful, but on this question the reader is referred to the more recent surgical writers. It is a defect which is much more common in males than females; of 68 cases collected by Mr. Earle, 60 occurred in the former.

20 INVERSION OF THE BLADDER.—If the urachus remain open after birth, the urinary bladder may be expelled, and thereby inverted through it. As far as we know, only one instance is recorded. A more frequent effect, however, of abiding patency of the urachus is, that the urine escapes through the umbilicus. A light truss, with a proper pad to press upon the umbilical opening, should be worn to prevent the passage of the urine.

21. ATRESIA VULVÆ.—Where this exists without occlusion of the urethra it produces no symptoms until the epoch of menstruation. When the malformation is such that the urine cannot escape, the united surfaces of the labia must be divided and kept asunder until cicatrization has taken place.

22. MALFORMATION OF THE INTESTINES.—When the meconium is not voided by stool within twenty-four or thirty-six hours after birth, we should seek for the cause of its retention. This may be due either to weakness or sluggishness of the intestinal walls, or to some mechanical obstruction. In the first case, a small dose of manna, or castor oil, or any other mild purgative, will quickly cause its ejection; in the second instance, the nature of the obstruction must be ascertained, if possible.

The most common cause of obstruction is *atresia ani*—imperforation of the anus—in which the rectum ends in a blind pouch at its inferior part. Where this alone exists, the rectum being present and normal as far as it goes, it is only necessary to wait until the gut distended with meconium can be felt, and then to make a puncture with a trocar and canula, or with a straight bistoury, through the tense membrane where the anus should be naturally; taking care subsequently to keep the orifice patent by a tent of lint.

In many instances it happens that the orifice of the anus is present, while the rectum is obliterated or absent; and in this case a much more serious operation must be practised—viz., either an artificial gut must be formed in the place where it ought to exist, or an opening must be made into the intestine in the left lumbar region. Where there is any hope of success, it is obvious that the first proceeding should be adopted; and to effect it, the surgeon must dissect back the parts down to the intestine, draw the latter forward, open it, and then by sutures secure the edges of the opening to the anal orifice. Unfortunately, we believe that this proceeding, though it has been successfully resorted to, is seldom practicable; and then, in order to save life, the colon must be opened in the left loin, after the manner proposed by Amussat in 1832. The steps of the operation consist in making an incision through the skin and fat horizontally, above and parallel to the crest of the ilium; commencing near the spine, and carrying the cut outwards for about two inches. Taking the interval between the external oblique and the latissimus dorsi muscles as a guide, the surgeon carries his incision through the muscles and fascia, so as to come upon the gut where it is uncovered by peritoneum. Any fat which may be in the way is then removed; and two threads are to be passed through the wall of the bowel—above and below—to steady it when opened; an opening is then to be made into the bowel, and its edges firmly secured by stitches to the sides of the external wound. Care will subsequently be required, lest the aperture closes; and an apparatus must be worn to prevent the involuntary discharge of the fæces.

An interesting case, showing the value of this operation (which has now been successful in many instances) is detailed in the *London Medical Gazette* of March 25, 1842. At the beginning of the year, an infant a few hours old was taken to M. Larrey on account of some impediment to the exit of the fæces. A cul-de-sac, about an inch and a half from the anus, was detected; and M. Larrey having tried unsuccessfully to introduce a catheter, plunged a trocar into the cul-de-sac (as was supposed), but no meconium followed the withdrawal of the instrument. When the child was forty-eight hours old, Amussat was consulted. The abdomen was hard and distended, the face dusky, and there was frequent vomiting. From the examination which was made, Amussat was led to believe that about two inches from the anus there existed an interruption of the rectum, the calibre of the gut being at this point totally obliterated; he was, therefore, of opinion that it was impossible to form an artificial anus either in the anal or coccygeal regions, but that an incision into the colon, in the left lumbar region, afforded the only chance of life to the child. The operation was performed; and four weeks subsequently the case was doing well, the fæces readily escaping through the artificial anus. A small tent was kept constantly in the aperture to prevent its closing.

There are other cases in which the obstruction is situated too high up in the intestines to admit of an operation. Dr. Jungnickel has related a good example. An infant born apparently healthy, passed no stools, but vomited meconium. An enema brought away a blackish mass, but the vomiting went on, and the child died on the third day. On examination, the œsophagus and stomach were found in a normal condition; but the duodenum was much enlarged, as was the jejunum for about a foot in length, when it terminated without exhibiting the slightest rudimentary connection with the rest of the canal. The latter, traced up from the rectum to the small intestine, terminated in an entangled knot, which was connected with the liver, near the fundus of the gall-bladder; it was empty, but up to the knot was movable. The rest of the organs were normal.

23. SPONTANEOUS AMPUTATION OF THE FŒTAL LIMBS IN UTERO.—It is now an undisputed fact, that amongst the many accidents to which the fœtus *in utero* is liable, we must allow a place to spontaneous amputation of the limbs. This remarkable injury may happen to either of the four extremities, or to any part of them, or to all of them. In the *Medical Times and Gazette* for December 10, 1853, is recorded the case of a child born with all the four extremities wanting; only short stumps of arms existed, but the parts were all soundly healed. At six weeks old the child was thriving and doing well. The head, spine, trunk, pelvis, and genitals all seemed perfectly normal in construction. The deficiencies, it was clear from the condition of the truncated extremities, had been produced by a series of intra-uterine amputations, and not by any arrest of development. No remains of the missing members were found. If the removal of the limb takes place at an early period of uterine existence, the separated member may be completely dissolved in the liquor amnii; but when the amputation occurs towards the end of gestation, the limb may be expelled after the membranes are ruptured, or it may come away with the placenta after the birth of the child, or it may be still partially attached by a fibrous cord, or by skin, &c., to the injured extremity.

The proved occasional causes of these accidents are, first, constrictions of the limbs by bands of false membrane, or by twistings of the funis; and secondly, compound fractures—these latter, however, are very rare, and are probably only efficient towards the end of utero-gestation. As regards the manner in which the false membranes or ligatures are formed, it is highly probable, as Dr. Montgomery has suggested in his treatise *On the Signs and Symp-*

toms of Pregnancy, that they are the result of inflammatory action; by which plastic lymph is poured out and organized, and subsequently becomes changed into pseudo-membranous bands or cords; which it is well known occasionally happens in other situations—*e.g.*, the pleura, pericardium, peritoneum, &c. As to the way in which the apparently local inflammation is excited, or the manner in which these ligatures become fastened round the limbs, no satisfactory explanation has yet been given; but when once applied, they may reasonably be supposed to contract; and as the tightening is aided by the growth of the limb, it necessarily happens that the integuments and other soft parts are gradually carried inwards, until the vessel becomes so compressed that sufficient blood cannot be transmitted to nourish the parts below the constriction. Hence the vitality of the limb becomes reduced; the bone—owing to the obstruction of its nutrient vessels—becomes brittle and weak; and finally, under some motion of the fœtus or its parent, the limb separates.

The usual length of the umbilical cord is about twenty inches, but it may be either much longer or much shorter. When very long—it has been found to measure forty-eight or even sixty inches —it is usually twisted round the body of the fœtus, or round the neck, or it may be fastened round one of the extremities. As a rule, the facility with which the smooth funis moves upon the body of the fœtus prevents its acting as a compressing agent; but occasionally it becomes adherent to the fœtus, and hence, as the latter enlarges, the cord acts as an amputating agent, just as the false membranes do. Excessive shortness of the funis—six or seven inches—is usually accompanied by deformity of the fœtus; and especially by that kind which consists in some morbid displacement of the viscera.

II. NON-CONGENITAL OR ACQUIRED MALFORMATIONS.

1. INTRODUCTION.—Among the number of persons who are seen to be afflicted with some kind of deformity, by far the larger proportion were born in a normal condition; disease or accident having been the subsequent cause of disfigurement.

Deformities arise chiefly from disease either of the bones, muscles, or ligaments; or from certain mechanical causes, such as the carrying of heavy weights, constantly sitting or lying in improper positions, &c. "Many portions of the osseous system," says Mr. Bishop, in his *Researches into the Pathology and Treatment of Deformities*, &c., "are concerned in the production of deformities, more especially those which transmit the weight of the head to the ground. These manifestly include the vertebral column, the pelvis, and the bones of the thighs, legs, and feet The circumstances that tend to produce those altered conditions of the bones which lead to deformities, comprise the constitutional derangements of the system which are connected with them, the chemical composition of the bones, and the influence of that composition on their physical constitution." In a healthy condition of the system the bones are strong, and will bear a great weight, or even a violent shock, without breaking. When, however, from any cause, the chemical constitution of the osseous system is altered, the case is different. In children the proportions of earthy and animal substances in healthy bones are nearly equal; in adults the earthy is to the animal material as 3 to 1. The earthy constituents of bone are, as is well known, the phosphate and carbonate of lime, and the phosphate and carbonate of magnesia; the quantity of phosphate of lime being, according to Berzelius, nearly five times greater than that of the carbonate. In abnormal states of the osseous system—as rickets—the animal matter probably always predominates over the earthy:—thus, in a rickety child, Dr. Bostock found the proportion to be—animal matter, 79·75; earthy matter, 20·25. (For a further account of this affection see the section on Rachitis, p. 145.) In mollities ossium—the rickets in adults, as some think—Dr. Owen Rees has found the mean proportion of the animal to the earthy matter, as 70·68 to 23·815. On the other hand, the fragilitas ossium of adults depends probably—at least in part—upon an increase of the earthy salts, and a consequent deficiency of the animal matter.

If the balance between the powers of different muscles be disturbed, distortions result. This is often seen in paralysis; where certain muscles, having lost their power from disease of the nerves distributed to them, are overcome by their opponents, which by contracting draw the limb or tissues away from the diseased side. In spasmodic muscular contraction from irritation of the spinal cord, &c., the effect is different, since the affected muscles by their preternatural contraction overcome the force of their healthy opponents, and so produce distortion on the diseased side.

Strumous, rheumatic, or other arthritic inflammations, are constant causes of deformity; either by producing complete anchylosis, or by impairing the free mobility of the joint through thickening and stiffening of the ligaments, fibrous tissues, &c.

The effects of deformity upon the physical and moral development of the individual are of great interest to the physician; for although the connection between deformity and character may be only accidental, yet it seems more probable that they sometimes at least stand in the relation of cause and effect. "It is undeniable," remarks Dr. Little, "that the consciousness of an infirmity of this nature has displayed itself in a most marked manner in many individuals who have been thus affected. Historians have described the influence of deformity in alternately stimulating the cultivation of the worst and of the best passions and instincts. The impeded development of the trunk from excessive deformity, or the wasting of a member during the growing period of life, often appears to occasion in the system a reserve fund of nervous and nutrient energy, which may be devoted to the elaboration of those parts the development of which is not impeded. Hence the mental vigour and surprising activity of the unaffected organs. Deformity of a part of the body may produce effects on the mind in a manner similar to those of a moderately sedentary mode of existence; the nervous and nutritive energies, unexpended in the muscular system, being employed to develop and sustain the mental faculties."

2. CURVATURE OF THE SPINE.—Curvatures of the spine are divided into three varieties—viz., *lateral curvature*—the convexity being to either side, though it is more frequently to the right; *posterior curvature* or excurvation; and *anterior curvature* or incurvation.

Scoliosis or Lateral curvature is the most common; and occurs especially in females, between the ages of ten and eighteen. Many girls, otherwise well developed, become the victims of this deformity, from *out-growing their strength,* as it is said—a phrase which means that the wants of the system are insufficiently supplied owing to the imperfect assimilation of food, and the use of too little exercise in the open air. The unnecessary and injurious custom still in vogue of confining the bodies of girls in stays or corsets may serve to develop deformity: for these supports not only impede the normal movements of the thorax and prevent the full expansion of the chest, but by usurping the functions of the dorsal, lumbar, and other spinal muscles, whose office it is to keep the spine erect, they materially weaken these muscles, it being a well-established law of the animal economy that diminished action leads to a diminution of tone and power. This opinion is also confirmed by the fact, that in warm climates, where the clothing is loose and stays unknown, lateral distortion of the spine is very uncommon. Another cause of this deformity is the undue exercise and consequent over-development of the muscles attached to the ribs and spinal column on one side, subservient to the motions of one upper extremity—generally the right.

Cyphosis or Posterior curvature chiefly affects the cervical and dorsal regions; and may be caused in infancy by the improper practice often adopted of lifting the child by placing the hands under the arm-pits, thus compressing the ribs and forcing out the spine and sternum.

Lordosis or Anterior curvature is the rarest form of spinal curvature, and is generally associated with some constitutional affection, producing disease of the bodies of the vertebræ.

The consequences of spinal curvature are sometimes very serious: and will vary according to the situation and extent of the mischief. When the thoracic and abdominal cavities are encroached upon, the play and movements of the viscera are interfered with; and, as full inspirations are impeded, dyspepsia results. Besides this, the action of the muscles is impaired, the general health suffers, and pain is produced by the pressure exerted upon the spinal nerves. Except when there is caries of the vertebræ, the spinal cord is rarely affected; but sudden death may occur from the carious bodies of two or three vertebræ giving way and crushing the spinal cord, or from the occurrence of dislocation of the odontoid process of the axis owing to ulceration and destruction of its ligaments.

Spinal curvature in early life is generally associated with disease of the spinal column; and the *Symptoms* which indicate that disease will be governed to a great extent by the locality affected. In addition to the generally enfeebled state of the child, there will be unmistakable evidence of a loss of power in the lower extremities; even in the sitting posture the child will be unable to remain erect, owing to the want of power in the muscles of the back, and in proportion as the disease affects the cervical, dorsal, or lumbar regions, so will the head, upper, or lower extremities give evidence of it. Moreover, when the dorsal region is involved, pulmonary symptoms will be well marked, and the upper extremities will either be weak, paralyzed, or subject to spasmodic actions. When the lumbar vertebræ are diseased, the sphincters will show it, as well as the lower extremities.

In addition to the foregoing symptoms, pain is a certain concomitant; and as the disease advances, and the spinal cord is reached, spasmodic twitchings, cramps, and other indications of pressure on the nerves result. By degrees the bodies of the vertebræ soften, and curvature, lateral or angular, anterior or posterior, supervenes. The mischief to the bone is much greater in the angular than in the lateral forms of curvature; indeed, in the latter it is the muscles chiefly which are at fault, while in the former the bodies of the vertebræ may be entirely destroyed. It is in these cases chiefly that the spinal cord is pressed upon and that symptoms resulting therefrom occur; in extreme cases there may even be complete paralysis, both of sensation and motion, of the parts below the seat of disease.

In the *Treatment* of spinal curvature the most important points to be borne in mind by the practitioner are these:—To maintain the general health at its highest point of efficiency by good nourishing food, sea air, ferruginous tonics, cod liver oil, and the compound syrup of the phosphates of lime, iron, soda, and potash, as sold under the name of "Parrish's Chemical Food," a most valuable preparation; we should endeavour also to strengthen the muscles and ligaments which act on the vertebræ by direct means, as by friction, palpation, shampooing, and gentle gymnastic exercises of various kinds; we must also forbid the use of articles of dress which prevent the free play of the muscles; and lastly, we should remove from the spinal column, by recumbency or some mechanical means, such weights or forces as tend to keep the various segments of the spine in an improper relation to one another.

In the treatment of curvature arising from disease and absorption of bone, it is indispensably necessary that the patient be kept in a state of perfect rest, and in a nearly horizontal position. For as the natural process of cure is by anchylosis, we shall best secure that result by perfect physiological rest. Our chances of effecting this will be guided largely by the extent of the mischief, and if only one or two bones are involved we may reasonably hope for a cure by timely and judicious management. If more bones are involved, though we may still be successful, we can hardly expect to avoid a state of permanent deformity. In carrying out this practice a spring bed, Dr. Arnott's hydrostatic bed, or one of Hooper's large water-cushions, will at times be found very valuable. With regard to the various spinal couches, and the numerous instruments recommended by different practitioners to cure this deformity, though possibly some of them may be useful in certain cases, we cannot help thinking that too much reliance is often placed on them, and that not only are they sometimes useless, but now and then we have reason to believe that they are positively injurious by harassing the patient, and by the blind confidence reposed in them to the exclusion of other and more valuable means. At the same time, we are willing to allow that in certain cases some assistance may be gained by their use, and with the above reservation we would refer our readers for further information on these topics to the writings of Lonsdale, Adams, Tamplin, Little, Bishop, Brodhurst, and others.

3. TORTICOLLIS.—Torticollis or wry-neck is characterized by an inclination and rotation of the head to one side, by which the ear is approximated to the upper part of the sternum. Any circumstance "that tends to disturb the equilibrium of the muscles which are attached to the thorax and to the head, may induce the deformity at any period of life—spasmodic contraction, paralysis, rheumatism, voluntary inclination of the head to one side during painful affections of lymphatic glands, during vesication from cantharides and other irritating applications, or the cicatrix of a burn Many of these causes act generally on the muscles of one side, and the deformity may, in the first instance, consist only of a simple leaning of the head to that side; but in consequence of the bulk and power of the sterno-cleido-mastoideus, and the freedom of its course, being unattached except at its extremities, this muscle promptly usurps a predominant influence, even when not specially affected, and converts a simple yielding of the head into a complicated deformity." (Little)

Treatment.—In transient spasmodic contraction of the tissues of the neck, no treatment will be required. But when the contraction is permanent, as in cases resulting from the tension of cicatrices, or from structural shortening of the sterno-mastoid muscle, a cure may often be effected.

Supposing it is certain that the sterno-mastoid is shortened, subcutaneous section of one or both of the origins of the muscle may be employed; taking care afterwards daily to apply a bandage or other contrivance, by which the head may be maintained in its proper position. The deformity resulting from a cicatrix must be relieved by the subcutaneous or open division of the cicatrix, followed by the use of gradual extension. Dupuytren's recommendation to make several transverse incisions at short distances through the whole breadth and depth of the abnormal band of tissue, is said by Dr. Little to be unnecessary; as he has invariably found one section, when made where the cicatrix is most free from adhesion to deep-seated structures, quite sufficient.

4. CLUB-FOOT.—Talipes or club-foot—a deformity produced by rigidity and contraction of various muscles—may be congenital, or it may arise shortly after birth, or at any subsequent period of infancy. When it occurs congenitally, it is often associated with other deformities or malformations, such as spina bifida, which is a very frequent accompaniment; other malformations of the brain and spinal cord are often seen. Some observers have noticed a certain hereditary tendency, but this has certainly not been our experience. There are numerous varieties of this distortion, the chief being—*talipes equinus*, in which the heel is elevated so that the patient walks on the ball of the foot; *talipes calcaneus*, in which the front part of the foot is elevated and the heel depressed, so that the latter receives the weight of the body; *talipes varus*, in which the foot is inverted, so that the patient walks on its outer edge chiefly; and *talipes valgus*, in which the foot is everted, so that the patient walks on the inner ankle. Besides these distortions, which exist in various degrees of severity, there are compound varieties, partaking of two of the preceding forms; their nature being explained by such names as *talipes equino-varus*, *talipes equino valgus*, *talipes calcaneo-varus*, &c.

Causes.—The exciting causes of non-congenital talipes are probably to be found in those circumstances which prevent the proper nutrition of the muscles, or which interfere with their supply of nervous influence. Thus club-foot may arise from wounds and accidents, chronic inflammation, rheumatism, &c.; from contraction of the cicatrices of burns; or from spasm and paralysis, producing a loss of balance between antagonistic muscles.

Treatment.—In all cases of club-foot where treatment is practicable, the sooner it is put in force and the condition remedied the better. When the case is seen before the contracted muscles have become rigidly fixed, the deformity may often be overcome by the use of gutta percha splints, bandages, &c.; and by attempting to strengthen the muscles by frictions, douches of cold water; and by removing the cause of the distortion. If these means fail or prove inappropriate, subcutaneous tenotomy should be resorted to at an early period, as the division of tendons seldom produces any dangerous consequences even in young infants. At the same time, it must be borne in mind that tenotomy, without the most careful after-treatment, will certainly fail of its purpose, and in very many cases the latter, which is strictly limited to mechanical means, will often alone suffice to effect a cure; it is probable that tenotomy is useful chiefly by facilitating the action of mechanical measures.

The rationale of this operation and the mode of performing it, are thus explained by Dr. Druitt:—"The tendon being divided, its separated extremities heal by a new connective tissue, which renders it longer, and which, while recent, may be stretched to any desired length. Thus the mechanical shortening of the muscle is neutralized. At the same time, the antagonist muscles, which become wasted and inert, are relieved from a constant state of tension; and are enabled to resume their natural functions, so that the limb rapidly increases in strength and bulk. The operation is easily performed thus:—The tendon is put on the stretch, and a narrow sharp-pointed knife is thrust through the skin on one side of it: then its edge is turned against the tendon, and made to divide it as it is being withdrawn. The tendon to be divided is the tendo-Achillis in the talipes *equinus*. The same in the *varus*, with those of the tibialis posticus, anticus, and flexor longus digitorum. In the *valgus*, the peronæi and the extensor longus digitorum; any tendons, in fact, which oppose the restoration of the foot to its proper position. It is often expedient to divide a portion of the plantar fascia, or of the muscles of the sole of the foot. Immediately after the operation, the foot should be put quietly up with splint and roller, with a dossil of lint and strip of plaster over the punctures, and be retained in the same position of deformity as before the operation. In the course of four or five days, apparatus must be adapted for bringing the part into proper shape."

5. FLAT-FOOT is that condition in which the arch of the foot being lost the sole rests flat upon the ground. It is most frequently met with in children of the poor, who have been obliged at an early age to gain a livelihood by some laborious occupation, and especially by lifting heavy weights. It occurs also in rickety children, and is probably in most cases associated with a softened state of the bones, or with an arrest in the process of ossification. As it comes on gradually, it is seldom detected in time to admit of cure; which is certainly a great misfortune, since it interferes very materially with walking.

The best *Treatment* is, in addition to any general plan for increasing muscular strength, by ferruginous tonics, quinine, and good nourishing diet, to apply stimulating frictions to the foot, galvanism, which is often of great service in increasing the nutritive powers, and to use a high-heeled boot.

6. CONTRACTED FINGERS.—The superior extremities are much less liable to distortion than the inferior. Contraction of one or more of the fingers—especially of the little finger—is sometimes congenital. Most commonly, however, it comes on at some period after birth, from disease of the palmar fascia; the middle, ring, and little fingers being the most subject to contraction. This deformity

increases slowly and gradually, is accompanied with stiffness in the palm of the hand, and inability to straighten one or more of the fingers: as it increases, the finger becomes drawn into the palm, and one or two years, perhaps, elapse between the commencement and the completion of the distortion.

Treatment.—No treatment will be of any avail except subcutaneous section of one or more of the bands of contracted fascia extending towards the fingers, as well as of the subjacent flexor tendons. Subsequently—at the end of two or three days when the puncture has healed—the contracted finger must be gradually straightened, and bandaged on a splint.

In imbecile or idiotic children the muscles of the hands are often found spasmodically contracted. This condition is best relieved by frictions, by improving the general health, and by attempting to educate, as it were, the fingers, as efforts are made to improve the general intelligence.

III. IMPEDIMENTS OF SPEECH.

The principal cause of those congenital impediments or defects of speech, which are commonly spoken of as *stammering* or *stuttering*, has been supposed by many to consist in some abnormality of one or other of the organs composing the vocal apparatus; one practitioner appearing to regard the tonsils, uvula, or velum as the organ chiefly instrumental in causing the defect; another referring the mischief to abnormal dentition; and a third looking to the frænum linguæ, or to some of the muscles of the tongue, as the part at fault. There is little doubt, however, that in the great majority of cases, if not in all, the affection is distinctly nervous in its origin, and is evidently a functional not an organic derangement; for even in the worst forms of stammering the vocal apparatus is generally found to be quite healthy. Hence the operations which have been performed to remedy this defect have not only failed to do good, but in all probability have, at least in many cases, done harm; indeed, it would be just as reasonable to expect to relieve St. Vitus' Dance by dividing the affected muscles, as to imagine that the performance of any operation on the tonsils, teeth, or muscles of speech can relieve a defect which seems very much allied to chorea both in its nature and origin.

Stammering may either be congenital or it may follow early illness. Nervous affections of various kinds are not very uncommon after the eruptive fevers, or after any severe disease that has given a shock to the constitution.

Dr. Arnott well observes that command over the organs of speech is acquired in the same manner as over all the muscular organs of the body; as, for example, in walking, skating, fencing, and performing on musical instruments. How important it must be then to pay attention to the training of the organs of articulation in early life; to take pains to aid children in acquiring the proper adjustment of the organs of speech; to take care that the child is not allowed to associate with one who stutters; and to attempt to check the defect as soon as it is noticed; firstly, by attending to the general health, so as to raise it to a normal standard; and secondly, by making the child speak slowly and distinctly, and especially, perhaps, by carefully teaching him to read aloud. In carrying the latter suggestion into practice, it is important that the lessons be not given in the company of other children. As an able writer observes:—"All scenes where speech is obligatory ought to be avoided; for example, I cannot too strongly reprehend the conduct of parents who send children who stammer badly to school, where, amidst the rest of the class, they are obliged to exhibit daily—a scene which is torture to those who have very sensitive minds. You may see the rush of blood to the face of the boy when called upon to construe: he may see the meaning of his lesson plainly, and yet be utterly unable to show his knowledge of it; he may be disgraced on account of this inability (for what public master can enter into all the internal emotions which cause paralysis of speech in one of a class of perhaps fifty boys!); he will feel a cold trickle at his head which tells him he is unlike others, and has no one to sympathize with him; he will care little for the undeserved punishment, but few can know how much for the source of all this, and of trials to come, to what amount he knows not. Scenes and reminiscences such as these may easily confirm an impediment in the speech."

When a habit of stammering has once been acquired, the anxiety and distress it occasions makes the difficulty of cure all the greater; but even under these circumstances special training and supervision, with a judicious study of elocution, will effect great improvement, more especially if the student will always try to think more of *what* he is saying than *how* to say it.

CHAPTER III.

ACCIDENTS, BURNS, &c.

I. FOREIGN BODIES IN THE AIR PASSAGES.

General Observations.—The number and variety of articles that may enter the air-tubes and give rise to severe or fatal mischief is very remarkable. The substances which are most frequently met with are—seeds of all kinds, beans, peas, cherry-stones, pieces of hard wood, buttons, pins, small coins, marbles, pebbles, bits of slate-pencil, beads, and small nails. The size of these articles is often such that it seems almost impossible they could have passed through the narrow chink of the glottis; yet that they do so is evident. Thus, Dr. Mott has recorded an instance in which a child only eleven months old inhaled a black shawl-pin two inches long, with a head nearly as large as a small marble: at Königsburg, in Germany, the larynx of a goose became impacted in the windpipe of a boy twelve years old: M. Bérard had to perform tracheotomy on a boy not quite seven years old, to remove a marble eight lines in diameter: and Sir William Fergusson has had to resort to the same operation to extract a plum-stone from the trachea of a girl seven years of age.

When the extraneous substance is of an animal or vegetable nature, it is apt to swell, owing to its imbibing moisture; so that a small bean or pea has been known to increase to thrice its original size in a few days. In some fortunate cases it has become softened and broken up, so as to permit of its expulsion piecemeal: when retained —as it usually is—the foreign body becomes incrusted with mucus, or with lymph, or even with a few grains of carbonate or phosphate of lime. The substance may get lodged in one of the ventricles of the larynx, or it may become fixed between the chordæ vocales, or it may be arrested in the trachea, or it may descend into one of the bronchial tubes, the right being that which is the more commonly selected.

Symptoms.—The entrance of foreign bodies into the larynx usually occurs during a violent and sudden inspiration; it gives rise immediately to severe spasmodic cough, great dyspnœa, and a sense of impending suffocation: sometimes even sudden death occurs by the arrest of respiration. Usually, after a few minutes, the violence of the first symptoms abates for a time, the cough and dyspnœa returning at variable intervals. Sometimes the calm lasts for many hours; but usually it is short, not exceeding twenty or thirty minutes. The with the substance, perhaps, in his mouth, or while attempting to throw it into that cavity; and especially if the symptoms, after having been interrupted for a few minutes, continue to recur, with their former, or even with increased, intensity at longer or shorter intervals.

The most common *Pathological Effects* are, inflammation of the mucous membrane, perhaps going on to ulceration, though the latter effect is generally confined to the tissues in immediate contact with the extraneous substance. The normal secretion of mucus is always increased, and not unfrequently it becomes muco-purulent, while in some instances the bronchi have been found loaded with this kind of secretion. When the foreign body is retained in one of the bronchial tubes, it may give rise to pulmonary collapse, if it completely obstructs the tube; or inflammation of the corresponding lung may be set up, resulting in all the ordinary symptoms of pneumonia. Abscesses also may form at the seat of obstruction; while in a few instances pulmonary emphysema has been induced: in others, pleurisy, leading to effusion: and in a very small number, inflammation of the heart and its investing serous membrane. Mr. Herbert Mayo has recorded a case in which a boy twelve years old died in consequence of the inhalation of an ear of rye: pulmonary irritation with the most fœtid expectoration followed, and hectic fever set in which proved fatal. On a *post-mortem* examination, the foreign body was found in an abscess between the lung and the liver; the latter having become involved by the extension of the inflammation through the diaphragm.

Treatment.—The foreign substance is sometimes spontaneously expelled, especially during a paroxysm of cough and dyspnœa; or it has occurred when the patient has been placed on a bed with his head hanging over the edge, the substance falling out by its own gravity; and in a few instances it has been expelled when the patient was in the erect posture. The period of this occurrence is variable: it may happen a few minutes after the accident, or it may not occur till months subsequently. Dr. Webster has recorded an instance where a cherry-stone was expelled sixty-eight days after its introduction, the patient having recovered after an attack of pneumonia, and abscess. Dr. Watson refers to an instance where an ear of barley was spontaneously ejected seven years after the accident, and the patient got well. In a few instances the substance has been got rid of by inverting the body, and smartly striking the back of the chest so as to dislodge the obstructing agents; occasionally, however, the latter, on touching the glottis, has given rise to such severe spasms, that it has very rarely passed out.

The facts above mentioned, and others like them, have been observed so frequently that practitioners have attempted to expel these foreign substances by the use of medicines, and especially by sternutatories and emetics. The anticipated result, however, so very rarely ensues, that the practice ought to be abolished, especially as it is not without danger, and sometimes causes the loss of valuable time. Still, as no patient can be considered safe who has a foreign body in the windpipe, the question arises, How is it to be got rid of? To this a very definite answer can be given, though of course in practice we must be guided by circumstances, and especially by the apparent urgency of the symptoms. When the foreign body is in the larynx, laryngotomy should be performed as early as possible: when the substance in question has descended lower, and, perhaps, in all cases in young children, the trachea should be opened. The substance may be ejected through the glottis, or through the artificial opening, directly the latter is made: but should this not take place, then after opening the trachea, the patient's body should be placed in an inclined position, with the head depending, and a few smart taps should be made to dislodge the substance. This position is not likely to be followed by any bad consequences, because the patient will breathe through the artificial opening; and hence the foreign body, whatever it may be, will not give rise to that severe spasm of the glottis which it would otherwise do. The question may be entertained whether this spasm of the glottis cannot be overcome by the inhalation of chloroform, without opening the trachea; but we are not aware of any instance in which such a plan has been tried. If, however, a surgeon determines to resort to it, he should be prepared to perform tracheotomy immediately, in case of the necessity arising.

When the extraneous body resists all efforts to remove it, the wound in the trachea should be kept open to favour its extrusion subsequently. When the operation, however, is successful, the incision should be immediately closed by strips of plaster, or by silver-wire sutures.

II. BURNS AND SCALDS.

Amongst the most frequent accidents that befall children, burns and scalds deserve prominent notice. These casualties vary, as regards their local and constitutional effects, according to the degree and duration of the heat, the extent of surface involved, the seat of the burn, and the strength of the vital powers at the time of the accident. The great depression, which follows immediately after the occurrence of an extensive burn, will necessarily be felt more severely by a weak strumous child than by one whose constitutional powers have been previously kept up to the standard of health.

Burns may be classified into four groups, according as they give rise to simple inflammation of the skin, to inflammation with separation of the cuticle and the production of blisters, to destruction of the papillary layer of the derma or cutis, and lastly, to disorganization of the entire skin down to the subcutaneous areolar tissue.

1. *Burns which produce simple inflammation of the skin* are

characterized by redness of the affected part, with slight swelling, and severe smarting pains, which last for some hours. They may be caused by the momentary application of hot water or steam, or by the rays of a strong fire, or even—in tropical climates—by exposure to the sun's rays. The constitutional disturbance is slight; and the local effects cease in a few days with desquamation of the cuticle.

2. *Inflammation of the skin, with the production of blisters filled with serum*, results from a more severe burn. The skin is in this case intensely red and swollen, the vesicles are often large, and the pain is hot and smarting: if the vesicles get broken or rubbed off, the excoriated derma becomes exquisitely sensitive. In favourable cases the epidermis exfoliates, and the part is restored to health without leaving any mark; but not unfrequently suppuration or superficial ulceration takes place, and a cicatrix is left to show the extent of the mischief. The constitutional symptoms are often severe, the shock to the nervous system being especially felt by delicate children.

3. *Destruction of the papillary or superficial layer of the derma* is distinguished "by the presence of one or more patches of a greyish-white, yellowish, or brownish colour, representing the dead portions of the papillary layer of the skin; the vesicles covering these patches are filled with a brownish, lactescent, or sanguineous serum, while those on the erythematous part of the burn are transparent. If the discoloured patches be lightly touched, they are found to be insensible; but if they be pressed with any force, so as to act upon the parts below, the pain is considerable. The pain attending this form of burn is always more severe than that of any other kind, in consequence of the seat of mischief being the most sensitive part of that organ of acute sensation, the skin; and it lasts for one or two days. In three or four days after the burn, the pain, which had ceased, is suddenly renewed, suppuration becomes active, and the process of separation, by which the dead is to be removed from the living tissue, established. When the ulceration finally heals, it leaves behind it a cicatrix, which is white from the loss of the vascular layer of the skin, and more or less fibrous and areolated, according to the depth in the corium to which the burn had extended." (Erasmus Wilson.)

4. *Disorganization of the entire skin down to the subcutaneous areolar tissue* takes place when the heat is prolonged. The pain is excessive during the application of the burning body, but soon ceases afterwards, owing to the destruction of the vitality of the part. A black, hard, dry eschar forms—or a soft eschar in scalds—which at the end of three or four days begins to be detached by suppuration: when perfectly separated, a deep ulcer is left behind. This ulcer gradually heals by granulation; but an indelible cicatrix is formed, which has a great tendency subsequently to contract. When the contraction is excessive, considerable deformity is likely to re-

sult: thus in burns of the neck, the chin may be drawn down to the sternum by the tightening of the cicatrix.

The constitutional *Symptoms* of the last two classes of burns are very important, and of two distinct kinds, viz., primary and secondary. The *primary symptoms* are due to the pain, as well as to congestion and irritation of the cranial, thoracic, and abdominal viscera. The shock to the nervous system from the agonizing sufferings may even destroy life almost at the onset; but where the patient survives this, the pain may—by exciting the heart, brain, and spinal cord—give rise to dangerous congestion of some of the vital organs. In one case there will be extreme prostration, stupor, and coldness of the extremities; in the other, restlessness, excessive excitement, and a high degree of fever. The *secondary symptoms* accompany the inflammation and suppuration which is set up for the removal of the destroyed tissues. The inflammation when severe produces general fever with symptoms of cerebral or pulmonary congestion: but it is soon followed by exhaustion, which increases the longer the suppurative stage continues. A curious observation has been made by Mr. Curling, to the effect that a sloughing ulcer sometimes forms in the upper part of the duodenum within a few days after a severe burn, and doubtless in consequence of it. Further observations are required, however, to confirm the correctness of Mr. Curling's views: since in twelve fatal cases which occurred in Guy's Hospital during the year 1855 and part of 1856 no disease of any kind was discoverable in the duodenum after death.

Treatment.—In the treatment of burns and scalds, the first object of the practitioner should be to relieve the pain and counteract the depression. For young children nothing better can be employed than small doses of opium in port wine or in sweetened port-wine negus, or chloral hydrate in orange syrup. When the suffering is severe, the inhalation of chloroform will be very beneficial; but a narcotic should be first administered so that the sleep or ease induced by the anæsthetic may be prolonged. The next point of importance to attend to is, the exclusion of air from the inflamed surface, and for this several applications have been recommended; one of the best means of accomplishing this is to paint the part over well with a mixture of collodion and castor oil; this forms an admirable protective covering when used in the proportion of two parts of collodion to one of castor oil: it should be freely applied with a camel's-hair brush, and be repeated once or twice a day, as long as necessary. Another very cooling and soothing application is Carron Oil—F. 165; which should be freely applied, and the parts then covered with a sufficient layer of cotton-wool to exclude the atmosphere. Some authorities speak highly of the use of flour, thickly dusted over the burnt or scalded skin: where there are no vesications it is useful; but when the cuticle is raised into blisters, these are apt to burst, and the serum mixing with the flour forms a dirty, irritating paste, which is with difficulty removed.

When the vesicles are large, it is better to puncture them with a fine needle to prevent their rupturing; but care must be taken not to remove the elevated cuticle. The importance of not disturbing the first dressings unnecessarily, can hardly be too strongly enforced; for independently of the suffering which such meddlesome surgery will always give rise to, the admission of the air to the inflamed surface will only increase the mischief When suppuration is setting in, warm light poultices or plain water dressings often give great relief; but if the inflammatory action is severe, cold goulard water lotions are to be preferred. In addition to the topical remedies mentioned, we would specially recommend the application of a saturated solution of bicarbonate of soda. This lotion not only favours the healing process, by stimulating the affected parts, but it also acts as a local anodyne. The area of the lesion must be protected by cotton-wool.

At the end of twenty-four or forty-eight hours, reaction will generally be established; and the occurrence of internal congestions must be guarded against. Simple effervescing salines and mild laxatives are then valuable, and will often suffice to remove all danger. But when reaction is excessive, much good will arise from inducing copious sweating; and in no way can this be better effected—when the child is irritable, restless, parched and thirsty, and with a hot dry skin—than by taking it out of bed, plunging it gently into a tub of water at 70° Fah., and then enveloping it immediately in several warm blankets. A copious perspiration will soon break out over the whole body, and is to be encouraged for several hours by freely giving sweetened water or barley-water.

The subsequent management should depend very much upon the condition of the patient, and the various symptoms must be combated as they arise; great caution being exercised in the employment of lowering measures. During the whole progress of the case the strength should be maintained by stimulants and nourishing food, by strong beef-tea thickened with arrowroot, with plenty of good milk, and two or three raw eggs daily. At the same time we must take care that the patient does not pass restless nights; on the contrary, we should endeavour by the use of sedatives to procure ease and sleep. Although young children are very susceptible to the influence of opium, yet this drug is very beneficial; and when the injury produces great suffering they will bear larger doses than in other diseases. One of the most extensive burns ending in complete recovery is described by Mr. Grantham. A youth, sixteen years of age, was burnt to the following extent by the explosion of some fireworks:—From the upper and fore part of the neck, extending laterally down the left arm to the insertion of the deltoid; occupying both axillæ; passing backwards to within three inches of the spines of the vertebræ; over the chest, body, and genitals, to the verge of the anus; extending along the upper part of the right thigh, and down the left thigh to the knee; destroying the cuticle, rete mucosum, and corium. The whole measured above six hundred superficial inches, and averaged a quarter of an inch in depth. The subcutaneous structure was completely lost, so that the arteries and veins were seen, as if neatly dissected, lying on the surface of the muscles and the fascia. The treatment consisted in giving opium freely, in supporting the strength, in properly protecting the wound, and in the external and internal use of antiseptics. Three months after the accident the patient had a sphacelated wound over the sacrum; four months after this, an attack of bronchitis; and two years subsequently—when he had improved so as to be able to walk a short distance—a severe attack of erysipelas. Five years elapsed from the time of the burn until the wound healed: during the whole of which time there was a greater or less tendency to congestion of the brain.

5. *Acute Laryngitis.*—There is a very common practice among nurses, which we have several times heard of, and which has not unfrequently led to most disastrous consequences, it is this:—At the conclusion of the meal known as "tea," the *bonne* frequently fills the teapot with water: so that when the children complain of thirst in the course of the evening there may be something for them to drink. In allowing the child to quench its thirst, it is not deemed necessary to pour the infusion into a cup; but the spout is offered to the lips and a draught is given. This popular habit leads young children to prefer drinking through the spout as often as the opportunity presents itself; but unfortunately they sometimes avail themselves of the nurse's absence to do so when the teapot contains boiling water; they may even experimentalize with the kettle. Most severe scalds of the fauces, glottis, and pharynx have been so produced; the spasmodic contraction of the constrictor muscles of the pharynx preventing the passage of the fluid further downwards, and so saving the stomach.

In the *Treatment* of these cases we must be guided by the principles already laid down: opium, and soothing diluents—such as treacle and water, or mucilage with liquorice—being especially required, to be followed if necessary by the bath. When œdema of the glottis arises, relief may, perhaps, be given by making rather free scarifications; but if suffocation seems imminent, laryngotomy or tracheotomy must be quickly performed. Unfortunately the operation does not often succeed, owing to the prostrating effects of the scald upon the system generally.

III. FROSTBITE AND CHILBLAINS.

1. Gelatio, or Frostbite.—Severe cold, when long continued, produces insensibility, arrest of the circulation, and death of the part to which it is applied. Examples of gelatio are very rarely seen in this country; but the unfortunate children of drunken parents sometimes suffer from frostbite, after exposure to the keen

night-air of winter. The management of such cases consists in gradually restoring the circulation to the affected part; friction with snow or cold water, followed by the cautious use of stimulants, local or general, afford the best means of effecting this.

2. PERNIO, OR CHILBLAIN, results from a diminution of the vitality in a limited portion of the skin, from the action of cold. The effect of the cold is not felt at first; but as warmth returns, there is itching and tingling, and the toe, or finger, or other part, is found on examination to be red and swollen. This condition lasts for several hours or even days, and the part then resumes its healthy condition. Sometimes, if the morbid action continues, vesication and ulceration take place, and what is called a *broken chilblain* results. Though a frequent disease of childhood, it is not limited to that period, but may occur at any subsequent time of life.

The *Treatment* consists in gentle attempts to restore the normal circulation and tone of the chilled part, by frictions with some soft powder, such as starch, or by means of stimulating liniments. For this purpose the compound iodine ointment, or the compound camphor liniment, or the turpentine liniment of the Pharmacopœia, may be prescribed: or the skin may be painted once or twice daily with the compound tincture of iodine. When the chilblain is ulcerated, it should at first be soothed with water-dressing or bread poultices mixed with goulard water; but subsequently—unless it heals kindly—it may be advisable to apply stimulating ointments, such as the ceratum resinæ mixed with a little turpentine. The constitutional powers will generally be found to be below the normal standard: tonic and stimulating medicines may therefore be required, and attention should also be paid to the digestive organs.

IV. CARBUNCLES AND BOILS.

1. ANTHRAX, OR CARBUNCLE, may be defined as an acute inflammation of a circumscribed portion of the skin, extending deeply into the cutaneous tissue, and forming a more or less prominent swelling on the surface. The tumour is at first red, but soon becomes livid; it is excessively painful, the pain being of a throbbing, burning kind; as it attains its full size, numerous little points on the surface suppurate, and form perforations through which the core issues in the form of a slough.

A large carbuncle is very dangerous; for not only does it indicate a vitiated state of the blood and an enfeebled constitutional power, which are alone sufficient to cause anxiety, but besides this, the pain and irritative fever which it directly produces, often give rise to great disturbance of the system generally. The nape of the neck is a very common situation for carbuncle. Generally, there is only one; but this may be followed by another, or even by a succession of them. Children very rarely suffer from them, though they do occur now and then; generally it is a disease of the latter half of life.

Treatment.—Mild aperients should be given at first, but these must be quickly followed by good nourishing food, and tonics—especially ammonia and cinchona, quinine and steel, or the mineral acids. Locally, water dressing, or linseed poultices, or poultices made with linseed and yeast, should be applied. When the pain is very severe, and the carbuncle threatens to be large, or the inflammation to extend, it may be necessary to make a free incision into it; or when the tension is very great, relief will be given by using the knife before suppuration has occurred; but there are many cases which do best if left alone. It was recommended by the late Mr. French to treat carbuncles and carbuncular boils by early subcutaneous incisions, with a small tenotomy knife, so as to give relifef at once to the engorged and indurated tissues, and thus to preserve the super-imposed skin. The parts are afterwards to be covered with a layer of collodion. The practice seems to be successful; but it must not be forgotten that incisions are apt to be followed by erysipelas, even when made subcutaneously. Good success has followed the practice of injecting a strong solution of carbolic acid into the centre of the carbuncle. Lastly, carbuncle associated with diabetes must never be interfered with surgically.

2. FURUNCULUS, OR BIOL.—A boil may be described as a miniature carbuncle; it commences as a small red and painful point, forming a little prominent tumour, which contains a central core or slough, and ultimately ulcerates so as to discharge this core. Boils may occur singly or in crops. There is often only one; but, as it heals, it is followed by others, which appear in different parts, one being succeeded by another for, perhaps, many weeks. The pain and irritability are out of all proportion to the size of the tumour: and we have seen patients quite worn out at the end of two or three days with the suffering they have endured. Weakly and strumous children often suffer from boils; and many seem especially prone to them even from early infancy: in them, however, they are generally of a chronic subacute variety, being attended with very slight inflammation, and giving rise to little or no constitutional disturbance.

The *Treatment* is the same as that recommended in the case of carbuncle; with this proviso, that incisions are much more rarely necessary. The internal exhibition and the topical application of tincture of arnica, are almost specifics in this ailment. In ordering a poultice, care must be taken to have it small, so as to cover the inflamed surface only; as otherwise it merely soddens the surrounding tissues, and, perhaps, predisposes to a crop of boils. When the pain is very severe, relief is often afforded by adding to the linseed-meal some laudanum or some solution of morphia.

V. BLOWS AND BRUISES.

1. BLOWS, &c.—The blows and bruises which children receive from the rough treatment of their playmates, from falls, and similar accidents, seldom give rise to anything worse than a certain amount of pain and some temporary disfigurement. It may be convenient, however, for the practitioner to remember, that in bruise-marks, "black eye," ecchymosis of the conjunctiva, &c., the best application—and the one used by professed pugilists, according to Mr. Tyrrell—is a poultice of black bryony-root (*Bryonia nigra*). The root is to be deprived of its external bark, finely scraped, mixed to a proper consistence with bread crumbs or flour, and then placed—in a thin muslin bag—over the discoloured part: a fresh poultice should be applied every six hours. The ecchymosis disappears in about forty-eight hours, even in severe cases. When the bryony-root cannot be procured, a linseed-meal poultice, mixed with a solution of hydrochlorate of ammonia, is the best substitute. Of late years arnica, in the form of tincture, has been extensively used as an application in cases of bruises, ecchymosis, &c., and in many instances it seems to be decidedly beneficial, diminishing the soreness, and promoting absorption of the effused products. There is, however, one drawback at least to its employment—viz., that it seems occasionally to induce erysipelas, and is frequently productive of a very troublesome eruption which gives rise to great irritation.

2. EPISTAXIS—or bleeding from the mucous membrane of the nose—may be produced by a slight blow, or by over-exercise, and not uncommonly it arises spontaneously, particularly during early childhood. When primary, it never continues to such an extent as to endanger life: but when secondary—as when it occurs in the course of hooping-cough, fever, purpura, &c.—its effects are often very serious.

The *Treatment* consists in the observance of quiet, the use of cold applications to the nose and forehead, and to the back of the neck—so as to produce contraction of the superficial bloodvessels by reflex action; the administration of mild laxatives, and the employment of astringent injections—as the decoction of matico: these remedies will generally suffice to stop the flow. When the bleeding continues obstinate, or ceases merely to return again, ergot will be found to be a potent remedy; mercury, given to the extent of producing slight salivation, has seemed to some beneficial. At the same time the bleeding nostril should be plugged with cotton wool soaked in a solution of alum; or it may even be necessary, as a last resource, to plug the posterior nares. It has been stated, that raising the arm opposite to the side of the bleeding nose, speedily controls and checks the hæmorrhage.